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Awards on Government Paper Are Delayed

Joint Congressional Committee on Printing Meets on Monday of This Week, Announcing That No Awards on Paper Would Be Made at This Time But That the Matter of the Awards Would Be Given Further Consideration — Committee Will Meet Again March 10 When Report Is Expected From NRA

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 5, 1934—The Joint Congressional Committee on Printing which opened bids a week ago today for paper for the Government Printing Office supply for the coming three months beginning April 1, met today but made no awards.

Announcement was made that no awards would be made but that the matter would be given further consideration.

Senator Duncan U. Fletcher, of Florida, chairman of the Joint Committee on Printing told your correspondent that the committee would call upon NRA for some information on paper, including presumably the question of prices. He stated definitely that the Committee had not rejected the paper bids received.

It is understood that the Joint Committee will meet again on March 10, at which time it expects to have a report from NRA. Whether the awards will be made at that time Senator Fletcher was unable to say.

Watab Paper Makers Assail Code

SARTELL, Minn., March 5, 1934—The International Brotherhood of Paper Makers, Sauk Rapids Local No. 149, William H. Mousky, president, and Fred Cruser, recording secretary, under date of February 28, 1934, have forwarded to General Hugh S. Johnson, administrator of the National Recovery act, through the St. Cloud compliance board, a complaint and petition relative to the operation of the NRA code at the Watab Paper Company.

Although sponsored by the union, the petition is signed by 179 employees of the Watab Paper Company, union and non-union. The complaint and petition is made in response to General Johnson's request for complaints and comments on the operation of the NRA.

The complaint and petition in full follows:

We the undersigned employees of the Watab Paper Company located at Sartell, Minnesota, in response to your request for complaints and comments on the operation of the NRA:

Protest against the Administration's compliance with recommendations of Newsprint Authority at Hearing in Washington, D. C., Feb. 1st, that the present price of newsprint, i.e. $40.00 and $41.00 per ton delivered, be continued through the year 1934, being in direct violation of the President's Agreement and the NRA provisions that products shall not be sold under cost of production.

The Administrator has had facts and figures presented showing that the market price of newsprint was lower than costs during 1933 before additional costs imposed by the NRA and that the present costs by weighted average of U. S. mills, of which three companies represent over 50% of the production, are from $6.00 to $7.00 per ton over proposed selling price, excluding interest charges on bonded indebtedness.

The Administrator also knows that numerous mills both in Canada and the United States were obliged to shut down or be placed in receivership before the additional costs of NRA were added, and that many other mills will be slowly and surely strangled in favor of a few high production favorably located mills, if the Administration does not propose to give the paper industry, and especially the newsprint division, the same fair consideration it proposes to give all other industries.

We also protest against the Administration's compliance to allow the newsprint division to operate as a separate division, thereby indirectly placing the members thereof under the influence of the large publishers, and dragging down the whole paper industry to the present chaotic level of newsprint.

The mill in which we have been employed for many years has complied with the President's agreement as to hours of employment from August 1, and with later provisions of the NRA as to hours of employment, but as yet has not been able to apply an equitable adjustment as to wages, due to the administration's failure to enforce a price on newsprint which will permit mills to meet the demands of the NRA.

As citizens of the United States and part of a large industry, we are drawing the above conditions to your attention with a conviction that your sense of justice will correct the impositions placed on the paper industry and permit it to contribute its just share to the economic recovery of our country.

Failure to do this will result, not only in maintenance of present inequitable or lower wage scales, but further unemployment by closing down of mills.

The Pulp and Paper Industry Under NRA Program

The Meeting at Washington Is Assured by S. L. Willson, President of the American Paper and Pulp Association That Paper Men Have Faith in Ultimate Benefit to Labor and Indusry Inherent in the Codes—All Branches of the Industry Are Well Represented

WASHINGTON, D. C., Mar. 7—"In behalf of the paper and pulp industry, I wish to assure the officials of the NRA of the faith of our industry in the ultimate benefit to labor and industry inherent in the NRA program," said S. L. Willson, president of the American Paper and Pulp Association and chairman of the paper code authority speaking at a group meeting on employment at the big NRA rally here this week.

The paper and pulp industry, continued Mr. Willson, "has presented one of the most complex series of problems that the NRA has met. Working in thorough cooperation in its various branches and with an understanding of the purposes of the NRA program, the industry has for the first time in its history undertaken a systematic solution of its problems. Much progress has been made not only in increasing employment and wage rates, but also in rehabilitating the industry itself. None doubt the efficacy of the NRA in making possible this approach to the solution of our problems.

Ranks Among Ten Largest Industries

The paper and pulp industry, ranking among the ten largest industries in the United States, is as widely distributed as any major industry that has appeared before the NRA. Paper is made in significant quantities in 37 states; the value of the production in 17 states ranges from $10,000,000 upward to more than $100,000,000 per year. Directly employed in the manufacture of its primary products over 145,000 wage-earners are now engaged. For each of these wage-earners three to four in addition are employed in the preparation of fibrous materials, in the production of the necessary chemicals, fuel and power and in the distribution of the final products of the industry. Furthermore, in excess of 125,000 additional wage-earners are employed in the conversion of paper into the numerous products for which it is used.

107,000 Employees in 1931

According to the Bureau of the Census, 107,000 employees were engaged in the manufacture of primary pulp and paper in the United States in 1931. A survey of the industry in 1933, just prior to the initiation of the NRA program, indicated a total employment of 105,000. The Code Authorities survey covering the month of December 1933, the first month of operation under the Code—incidentally a month of abnormally low production—shows that employment has been increased to more than 145,000 wage-earners, an increase of 38 per cent since the affectuation of the Code. This, I repeat, was accomplished in spite of a reduction in production.

The average of hourly wage rates was 57 cents per hour in December, 1933 as compared with 42 cents per hour in May, 1933 and 56 cents per hour in May, 1929. Average weekly earnings, however, were not as great in December, 1933, as they were in either May, 1929, or May, 1933, due to the much lower rate of production. It should be stated, however, that of the full forty hours of work contemplated under the provision of the code are worked, the average weekly earnnigs in the industry will equal or exceed the average weekly earnings for the 48 hour week effective prior to the code. The total payroll, practically the same in December, 1933, as it was in May, 1933, was divided among 38 per cent more wage-earners. The lower proportionate share of each worker was due to conditions wholly beyond the control of the industry itself.

Wage Earners' Share Increased 6 Per Cent

The data available for comparison at the present time is wholly confined to the first month of operation under the code and, unfortunately, to a month which although normally a low production month, was abnormally low this year. Production of paper in December, 1933, for instance, was 20 per cent below production in July, but the wage-earners' share in the total sales dollar had increased about 6 per cent, according to our calculations.

It is important to realize that the paper industry demands continuous integrated operation. All mills, both large and small, employing three or four shifts of workers, operate continuously 24 hours per day for as many days per week as orders permit. Operating time is obviously related to paper demand; and demand for paper regulates total payrolls and earnings over any given period. The average hours per worker in the month of December, 1933, were 37.5 per cent less than the average in May, 1933, due to short running time and to the greater number of employees engaged and this in spite of the fact that the number of machines employed in paper production in December, 1933, was 18 per cent less than in May, 1933.

Burden Shared Both by Industry and Labor

The burden of the greater numbers employed and of the increased hourly wages was shared both by the industry and by labor, the greater part being carried by the former as indicated by comparative labor costs per ton of output. The labor cost per ton of paper for all reporting mills was 41 per cent greater in December, 1933, than in May, 1933. During the same period prices per ton of paper increased but 23 per cent, or 18 per cent less than the labor cost. The effectuation of codes in the industries that supply the paper and pulp industry resulted in substantially greater raw material cost. But these costs, in so far as available information indicates, are substantially less than the increase in the labor cost per ton of paper. In other words, the increased costs in the manufacture of paper and pulp through the absorption of direct additional labor costs, together with the indirect additional costs of raw materials, partially resulting from labor provisions of the respective codes, has not yet been covered by a corresponding increase in the price for the finished product.

Two Important Conditions

I quote these statistics to point out that the paper industry can only absorb a larger portion of the unemployed workers in the United States by shortening the hours of labor in the industry under either one of two conditions, i.e., higher prices for paper or lower weekly earnings. The effect upon purchasing power is approximately the same in either case except that paper prices are relatively lower at the present time than the prices of other commodities. The immediate effect of shorter hours and of higher hourly rates would be upon paper prices under such circumstances.

It may be necessary because of local manufacturing conditions that some exceptions to the labor provisions of the code as to hours of employment should be conceded to certain small mills, under a form of permit.

Influence of Depreciated Currency

The paper and pulp industry was seriously influenced by competition from depreciated currency countries from 1931 to 1933. This, combined with the results of over-production, depressed prices below cost levels. Due to the initiation of the Recovery program, the demand for products of the industry increased, reaching a level for a short period approximately equal to practical production capacity, but much of this demand was speculative in nature and it obviously led to rapidly increasing prices from extremely low and sub-cost levels. The increase averaged 23 per cent, but the new levels were in the case of all major grades considerably below 1926 levels, which levels were below the levels of 1929 prices.

I point out this situation to indicate that the industry can absorb through compensatory higher prices a relatively larger proportion of the cost of employing additional workers, than the workers themselves will be forced to absorb if total payrolls are divided between a greater number of workers without price increases.

Depends Chiefly Upon Price Structure

The part that the paper and pulp industry can play in further alleviating unemployment depends, therefore, chiefly upon the price structure. The industry at the present time is carrying a burden of 35 per cent of its total production capacity as idle. Paper prices invariably sag whenever the operating ratio falls below 80 per cent. It is apparent that the price structure in the paper industry is in a precarious position. I point this out because of its direct relationship with the ability of the industry to absorb immediately a greater share of the unemployed without special means of controlling production, or through the open-price filing provisions. The paper and pulp industry feels that the open price provision is essential to its stabilization and future progress; that aside from the labor provisions of the code it is next in importance; that without its maintenance, its whole structure is at stake, and the elimination of that provision of its code would result in a recurrence of jungle competition existing prior to the codes, so long as excessive over-capacity exists, without some control of production. There has been no attempt or inclination on the part of any branch of the industry now under the provisions of the code to exercise any possible opportunity to establish prices not justified by costs, and the paper and pulp industry will welcome any investigation of this statement by those who contest it. In the application of the open price provisions of the code the large units of the industry believe that it is a protection to the smaller units. The effect of the open price filing provisions of the code is to keep prices down, rather than to advance them to monopolistic heights. Since every member under the General or Subordinate Codes large or small has the privilege of filing competitive sales prices hand in his costs —which prices if lower must necessarily be met by those who have previously filed higher sales prices—if they were to successfully compete.

Relationship of Manufacturers and Labor

The relationships between manufacturers and labor, as a whole, have been of the best and although the percentage of union members among the employees in the paper industry has been low, normally less than 15 per cent, the relationship between management and the unions has been upon a relatively high plane. This is due not only to the character of the workers and management, but also to that of the union leaders in the two organizations that represent paper and pulp mill workers.

The adjustment of wages above the minimum has not in all cases met the expectations of the workers. On the other hand, probably an equal number have gone through the four years of depression with no reduction whatsoever in the hourly rates of pay and many others have escaped with reductions of ten per cent or less.

A Rural Industry

The paper and pulp industry is essentially a rural industry. As American industries go, it is a relatively old industry. More than 60 per cent of the mills in the industry constitute the chief source of employment in the communities in which they are situated. They have grown up with the community and the interests of management and labor in the welfare not only of the mill but also of the industry are inseparable. Under such conditions, the problem of rehabilitation of American prosperity becomes one in which every member of the industry's organizations is vitally interested.

It is for such an organization that I speak and in its behalf urge that the NRA program be continued unaltered except as improvements gained through experience may be incorporated in its structure.

Harrison Baldwin Speaks

Harrison Baldwin of the Hammermill Paper Company, Erie, Pa., talking to the conference on fair practice rules said:

In discussing the question of open price filing and its effect on small industries, it is unnecessary to go into the merits of the open price filing system itself, since that subject is so ably and amply considered in another group.

The entire evening last night in Memorial Hall was devoted to this subject and the principal objection, perhaps the only objection, came from the retailers who insist upon having what they term "private prices" by which they may buy without regard to the welfare of the producers from whom they obtain their merchandise. Since the retailer himself makes a profit on the goods he handles regardless of cost to him, it would seem only fair in the spirit of the purposes of the National Recovery Act, that he should concede the right of the manufacturer to make a profit also.

With respect to the effect upon the small industry, there is one certain way in which open price filing affects the small industry as well as the large one, that is, that prices, terms and conditions are brought out into the open where all can see instead of remaining in the dark where they were suspected but unproven all along.

Second, the open price filing system enables the small producer to know what his larger competitor is doing. Under the open price system for the paper and pulp industry, a manufacturer is prevented from filing a price below his own costs. This in itself is a benefit to the small manufacturer because it prevents the bigger producer from dissipating his reserves in order to get business and to an extent that would ruin the small mill.

Just because an industry is small does not mean necessarily that it has high costs. The contrary is generally the case, for the small producer has lower overhead and enjoys the advantage traditionally belonging to the one-man concern.

Third, the open price system is beneficial to all the units of any industry which has adopted it. First, because it prevents secret price cutting which is the bane of all indus-

(*Continued on page* 58)

More Storage Reservoirs for Wisconsin Valley

Improvement Company's Plans for Benefit of Paper and Power Plants Moving Satisfactorily—Application for Loan of $700,000 From PWA Approved by State Adviser William G. Bruce—Estimated Entire Project Will Cost Approximately $5,000,000

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., March 5, 1934—Developments are moving satisfactorily on the Wisconsin Valley Improvement Company's plans to construct storage reservoirs on the upper Wisconsin river for the benefit of paper mills and power plants in that locality. The company's application for a loan from the Public Works Administration for $700,000 to build a reservoir on the Big Eau Plaine river has received approval from William George Bruce, state PWA adviser, pending completion of the formal application to be sent to Washington.

The Wisconsin Valley Improvement Company is a joint corporation made up of several paper companies, including the Marathon Paper Mills Company, the Consolidated Water Power and Paper Company, the Nekoosa-Edwards Paper Company, and others. Reservoirs are to be built on the Big and Little Eau Plaine rivers to hold back flood waters for release into the Wisconsin river when the latter stream is at low stage, thereby stabilizing water power for paper mills.

W. F. Thiele, chief engineer of the Consolidated company, announced that the application for the PWA loan was filed at Madison, Wis., December 31. A final, more detailed application will be filed when all plans for the project have been completed. Mr. Thiele has done considerable work in advancing the project.

The present loan covers only the one reservoir on the Big Eau Plaine, but it is estimated that the entire project will cost $5,000,000, including a dam across the Wisconsin river near the reservoir outlets, to be built by the Consolidated company.

Tomahawk Kraft Reorganization Plans

Reorganization of the Tomahawk Kraft Paper Company, Tomahawk, Wis., appears to be taking definite shape. After plans had been dropped for a merger with the Mosinee Paper Mills Company, conferences between stockholders and bondholders with C. F. Smith, Wausau, Wis.; P. C. Waite, Oshkosh, Wis., and J. A. Auchter, Milwaukee, Wis., the bondholders' protective committee filed notice with the federal trade commission of a plan which calls for the deposit of $1,150,000 in first mortgage sinking fund bonds of that company.

It has been proposed that a new corporation be created which will take over assets and liabilities of the old company. The proposed firm is to have an authorized capital of 75,000 shares of common stock, of which 18,000 shares will be given to the original company for its properties.

Paper Chemistry Institute Progresses

Three additional trustees have been elected on the board of the Institute of Paper Chemistry at Lawrence College, Appleton, Wis. They are: Rex W. Hovey, vice-president of the Oxford Paper Corporation, New York; Harry P. Carruth, executive vice-president of the Mead Corporation, Chillicothe, Ohio, and Robert Wolf, vice-president and general manager of the Weyerhaeuser Timber Corporation. Formerly, the board was made up of Wisconsin paper manufacturers, but these additions give it a nation-wide complex, inasmuch as mills all over the country are supporting the Institute as a research center for the paper industry. Ernst Mahler, vice-president of the Kimberly-Clark Corporation, one of the originators of the Institute, is president.

In a recent report on the progress of the Institute, Dr. Henry M. Wriston, president of Lawrence College and secretary of the Institute, said it has established a world-wide reputation. In four years, it grew from a little institution on the second floor of the college gymnasium with a single professor, to a school now housed in two magnificent buildings with a staff of 42 persons. The budget has been advanced from $25,000 to $140,000 annually. The equipment in its laboratories is now among the finest in the world, and it has a more complete research library than is found in any country in the world relating to the paper industry, including subscriptions to more than 400 trade, technical and scientific periodicals.

The wide field of industrial research made possible by the Institute has attracted to its support hundreds of the largest companies in the world, Dr. Wriston added. This was dramatically demonstrated when the NRA code developed, and no other institution or laboratory was capable of undertaking the testing program as a basis for grading paper. More than 120,000 individual tests were made for manufacturers. It has been necessary to employ three shifts working twenty-four hours a day to render the service the industry demanded. Graduates of the Institute are now scattered in mills all over the country.

News of the Industry

Construction work on the four-story plant addition to Appleton Woolen Mills, Appleton, Wis., will be completed about April 1. Approximately $50,000 is being spent on the structure. All of the exterior work has been finished, and the interior will be ready soon. The second floor already is in use for storage purposes, and the remainder will be used for additional factory and shipping space.

Because of increased demands, the largest machine of the Dells Paper and Pulp Company, Eau Claire, Wis., has been changed over to handle "Fruit Wrap," which is being marketed to all the important fruit centers. More than fifty carloads a year are being used by the Yakima and Wenatchee fruit districts of the State of Washington alone. The company last year supplied 3,750 tons of stock for wax and oil converting for use of the Chicago packers in meat wrapping. The annual production now represents about 1,200 carloads. Stephen R. Davis, president, who succeeded his father, W. L. Davis, recently deceased, is now general manager, and the mill retains 350 employes.

J. D. Mylrea, Rhinelander, Wis., president of the newly organized Spruce, Inc., Ashland, Wis., has been elected a director of the Northern Hemlock and Hardwood Manufacturers Association. A bureau of conservation was established at the annual meeting last week, to assist in the Wisconsin reforestation program.

Ralph Raschig, who was manager of the Little Chute Pulp Company, Little Chute, Wis., from 1916 to 1923, died February 24 at his home at Appleton, Wis. He was secretary and treasurer of the Langstadt Electric Company at the time of his death.

Newsprint Paper Output Increases in Canada

Domestic Bureau of Statistics Reports Production in January Reached 188,374 Tons—Best Showing by Industry Since 1930 and an Advance of 35 Per Cent Compared with January, 1933 —Shipments Keep Pace With Production, Totalling 187,352 Tons

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 5, 1934—Canada last month produced 188,374 tons of newsprint, which, according to the Dominion Bureau of Statistics was the best showing by the industry for any corresponding month since 1930, and showed an advance of 35 per cent as compared with January, 1933. Shipments kept pace with the output, being 187,352 tons. Stocks of newsprint in Canada totalled 34,711 tons at the end of January.

Exports of newsprint for January amounted to 3,756,413 cwt., valued at $6,415,668, compared with 2,555,585 cwt., valued at $5,204445 in January 1933.. For the twelve months ending February the total exports amounted to 37,962,926 cwt., valued at $70,411,738, as compared with 34,632,587 cwt. valued at $79,509,558, in the corresponding previous twelve months. Exports of wood pulp of all kinds in January amounted to 954,828 cwt., valued at $1,974,064, as compared with 714,157 cwt., valued at $1,457,306 in January, 1933. Exports of pulp wood also showed an increase, being 23,238 cords, valued at $130,590, as compared with 13,897 cords, valued at $90,409 in January, 1933. Total exports of paper and manufactures of paper for January were valued at $6,782,480, as compared with $5,422,787 in January, 1933.

Mill Speed Output

The Shawinigan Falls plant of Consolidated Paper Corporation operated at 50 per cent of capacity during January, with three machines. By putting a fourth machine into operation this month output is expected to be increased to 65 per cent. The Grand Mere plant, formerly the Laurentide Company's mill, has been operating at full capacity and expects to continue at that rate for several months.

St. Lawrence Paper ills, at Three Rivers, plans shortly to step up operations from 50 to 75 per cent of capacity and Wayagamack newsprint mill at the same centre is working at 75 per cent, while the kraft and groundwood mills are at 75 per cent capacity.

At Quebec the Anglo-Canadian Pulp and Paper mills are working on large orders for England, which are keeping them at full capacity.

Canadian International Paper Company's Three Rivers plant is reported producing at 90 per cent, while the figures for its other mills are: Gatineau, 95 per cent; Temiskaming (Kipawa), 100 per cent; and Hawkesbury, 100 per cent.

From Vancouver it is reported that the two big newsprint producers, Powell River Company and Pacific Mills are operating at capacity and have been doing so for some time, the increase in the output having been made possible by orders from China, Japan, Australia and other overseas countries.

More Power Consumption

The increased activity in pulp and paper manufacture is reflected in larger consumption of hydro-electric power from the plants of the Shawinigan Water and Power Company. During the past week the company brought into operation the first of four 40,000 h.p. units to be installed at the Rapide Blanc plant on the Upper St. Maurice River. It had been expected that the plant would not be brought into production until somewhat later in the year, but as the work has been well ahead of schedule the first unit started delivery power at two-thirds of capacity last week-end. The power is delivered to Grand-'Mere over a 200,000-volt transmission line.

This additional power will be readily absorbed by Shawinigan. For several months past the demand for the company's primary and secondary power in its territory has shown a subsequent increase. The newsprint, asbestos and other industrial users have been taking larger quantities, while retail distribution has been growing steadily.

Cut in Stumpage Tax Brings Good Results

Premier Tilley, of New Brunswick, reports that the cut in stumpage tax in that province brought good results in the last fiscal year.

"Stumpage," he states, "exceeded the estimate by $30,577.13, due principally to a large summer cut of pulpwood. The increase in cut and consequent increase in stumpage more than offset the credit rebate of fifty cents per cord made on summer-peeled pulpwood, and the waiving of the additional stumpage of fifty cents per cord on account of export. Both reductions were made to stimulate employment and brought substantial results in an increased cut and employment. Royalties increased by $9,406.70 over the estimate, making the total royalties $32,406.70."

Rolland Paper's Earnings Higher

The annual report of the Rolland Paper Company, Ltd., of Montreal, just released to stockholders, shows that in 1933 there was an improvement in both earnings and working capital as compared with the previous year. Earnings after operating expenses and taxes, but before depreciation, were $333,871 against $323,764 for 1932, equal to 2.40 times bond interest and exchange charges of $138,822. After payment of these charges and provision of $100,000 for depreciation, compared with $84,000 in the preceding year, there remained a balance of $95,049, out of which the year's dividend of $90,000 was paid on the preferred stock and the balance of organization expenses, $2,791, was written off. Surplus for the year, after these deductions, was $2,258, making the accumulated surplus $315,445.

Liquid position at the end of 1933 continues to be very satisfactory, the balance sheet showing current assets of $1,233,567, against current liabilities of only $159,679—indicating net working capital of $1,073,888, compared with $1,071,199 at the end of 1932, and a ratio of current assets to current liabilities of nearly 8 to 1.

The company's mill at Mont Rolland has a capacity of 60,000 pounds per 24 hours of bond, ledger, writing, envelope, book and lithograph paper.

Royal Card to Distribute Champion Lines

The Royal Card & Paper Company, New York, has been appointed distributor for all of the lines of the Champion Coated Paper Company, Hamilton, Ohio and the Champion Fibre Company, Canton, N. C.

Representative stocks of these lines will be carried in their New York warehouse.

New Alkali-Chlorine Plant for Cornwall, Ont.

Plant Second of Its Kind Established by Canadian Industries, Ltd., for Manufacture of Chlorine and Caustic Soda—Decision to Proceed With Project Made Only After Survey of Future Outlook for Pulp and Paper Industry in British Dominion

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., March 5, 1934—Confidence on the part of directors of Canadian Industries, Ltd., one of the most powerful industrial organizations in the Dominion, with extensive interests in the explosive, chemical, paint and varnish, cellophane and other fields, in the pulp and paper industry in Canada, is indicated by the announcement of plans for the establishment of a new alkali-chlorine plant at Cornwall, Ont., at an estimated cost to the company of $1,200,000.

The plant, which is being established for the manufacture of chlorine and caustic soda, will be the second of its kind in the C.I.L. system, the other plant being located at Sandwich, Ont. The chief market for the products of the new plant is derived from the pulp and paper industry and an official of the company stated that it was only after a survey of the outlook for the pulp and paper industry that the decision was made to go ahead with the project.

The new plant, the site for which consists of 23 acres fronting on the Montreal highway and adjoining the Howard Smith Paper Mills in Cornwall, will be favorably located with regard to transportation facilities, having available the C. P. R., Canadian National, and the New York Central railroad lines, in addition to the St. Lawrence River route. Salt, which is the principal raw material used in the manufacture of chlorine and caustic soda, will be derived from the company's own alkali deposits at Sandwich, while an agreement for the supply of the large quantaities of water required in the process has been concluded with the city of Cornwall.

Provincial Maintains Its Earnings

At the annual meeting of Provincial Paper, Ltd., at the head office in Toronto last week, reports showed that the earnings of the company were maintained in 1933 at $553,849, compared with $614,678 in 1932. Out of the year's earnings, $230,701 was provided for interest and exchange and $100,000 for depreciation, leaving $223,148 available for preferred dividends of $245,000. In addition to earnings from operations, the company had profit on bonds cancelled of $27,015, and the net result of the year was an increase in surplus from $682,934 to $688,098. The company's liquid position shows improvement, with net working capital $68,120 higher at $2,140,552, and the ratio of current assets to current liabilities 7.7 to 1. Current assets valued at $2,461,698 include Dominion and Provincial bonds of $995,590 and cash of $397,030. Current liabilities are shown at $321,146. During 1933 the company cancelled $900,000 of first mortgage bonds previously purchased for sinking fund. Sinking fund is now taken care of until 1940. Business and earnings for the past six months of 1933, the statement says, showed an improvement over the first half of the period and over the corresponding period of 1932.

In combined output Provincial Paper is one of the largest manufacturers and distributors in Canada of high-grade and book papers, its four plants, all in Ontario, operating eight paper machines, six paper-coating machines, and sulphite and ground wood mills having a daily capacity of paper production of more than 190 tons. Its timber limits are advantageously located near the company's pulp and paper mill at Port Arthur.

Pulp and Paper Industry Large Power User

According to statistics just released from Ottawa, the production of pulp and paper is Canada's most important manufacturing industry as measured by both gross and net values of manufactured products as well as by distribution of salaries and wages. Canada for the past several years has led the world in the production of newsprint with approximately double the output of any other country and, as approximately half of the newsprint produced in Canada is exported, the effect of the industry in producing a favorable trade balance is very great. In the production of newsprint, low cost motive power is almost as important a factor as is an abundant supply of raw material. As approximately 100 h.p. is required per ton of daily output, motive power in the industry is practically restricted to water power. The outstanding position of the Canadian pulp and paper industry is due to the fortunate location of abundant water power advantageously distributed among extensive forests. This industry, the largest individual consumer of industrial power, has a total hydraulic turbine installation of 600,996 h.p. In addition to this primary power, hydro-electricity is purchased from central electric stations to operate a motor installation of more than 1,031,000 h.p., so that the hydraulic installation to supply motive power to the industry totals more than 1,632,000 h.p. This represents more than 89½ per cent of the total power equipment of the industry. Large amounts of hydro-electricity are also purchased for use in electric boilers to produce steam for heating and pulp cooking.

Burt Company Earnings Are Lower

Earnings of F. N. Burt Company, which is one of Canada's largest consumers of paper, were 96 cents a share in 1933, as compared with $1.63 a share in 1932. Shareholders have been informed by S. J. Moore, of Toronto, in the annual report, that earning power began to recover in the latter half of the year and that business in the early weeks of 1934 is still continuing to show improvement. Common dividends paid in 1933 amounted to $215,088 as compared with $274,191 in 1932, but this was larger than earnings and the surplus dropped during the year from $1,047,998 to $936,758.

Notes and Jottings of the Trade

The Thunder Bay Paper Company, Port Arthur, Ont., is now using the large groundwood slush storage tank which was recently erected.

Signs of revival in the pulpwood industry are evident in the lakehead district, according to word from Port Arthur. Approximately 100 trucks are engaged in hauling heavy loads to depots from bushland camps. From Marks Township alone, one company is hauling out some 2,000 cords of wood. Many district roads have been kept open all winter and traffic has been unusually heavy.

While the Fort Frances Pulp and Paper Company at Fort Frances, Ont., has not yet been reopened and no assurance has been given by the receiver as to when operations may resume, it is stated that when the mill starts running again it will only be on a part-time basis.

March Announcement

Time To Re-fill —

Look to your Beater Rolls, and order your next fly bars from us.

Years of experience in making and heat-treating fly bars have taught us to put the best value into our steel. We make practically every fly bar shape, and carry large tonnage of fly bar and bed plate steels. May we have your orders?

— Dilts —
MACHINE WORKS Inc. FULTON, N.Y.
"Your Paper Is Made in Your Beaters"

Demand for Paper Less Active in Chicago

Natural Slowing Up Follows Extensive Buying of Various Standard Grades of Paper During Early February—Paper Mill Representatives Continue Optimistic, However, Encouraged by Trade Practice Provision, Now Beginning to Be Effective

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., March 5, 1934—While February was a satisfactory month in every respect, Chicago paper representatives report a slowing down of demand during the past few days which is not entirely understandable. Majority reports indicate a natural slowing down following extensive buying in early February, in particular. The comparative decline in demand is not considered alarming and paper representatives continue to look with favor and optimism on the trade practice provisions which are just now beginning to be effective.

Slowness in demand has not affected prices, markets remaining firm and, in some instances, higher prices are expected as readjustments are being completed. Ground wood prices are firm with demand at least holding its own. Fine papers are only moving slowly. Kraft indicated a similar situation. The paper board market felt a similar lull, after the filling of extensive requirements resulting from prohibition repeal and general business improvement. Books and covers remained about the same.

Association Activities

The Chicago Paper Association held its regular meeting on Tuesday evening, February 27, at the Blackstone Hotel. The meeting was featured by a report on the New York convention given by James F. Danehy, secretary of the coarse paper organization. Mr. Danehy not only outlined the various discussions as pertaining to the Chicago Paper Association but also provided some interesting accounts of the Code of Fair Practices effecting the coarse paper field. M. A. McNulty, president of the Association, was in charge of the meeting.

Officers of the Western Paper Merchants Association, elected late last month, are reported as follows: President, E. B. Schmidt, Parker, Thomas & Tucker Paper Company; first vice-president, P. A. Harris, Graham Paper Company; second vice-president, J. Knox, Chicago Paper Company; secretary, W. W. White, James White Paper Company; and treasurer, K. E. Hellstrom, Messinger Paper Company. The association is very active, and particularly at this time on the code of fair practices governing the industry.

R. C. Johnson, Northwest Paper Company, has begun his career as newly elected vice-president of the Middle West Division of the Salesmen's Association of the Paper Industry with the appointment of members of the important Trade Customs and Fair Trade Practices committee. This committee will be in charge of a general chairman, Harold Knott, Eastern Manufacturing Company, and will be composed of representatives from each of the trade lines within the association. The committee's function will be to unify trade customs and fair practices of all divisions as requested and instructed by the Code Administrator.

News of the Trade

James H. Coy, well known to the entire paper trade for his business and association activities, has been elected vice-president in charge of sales of the Flambeau Paper Company, the much merited advancement taking place at a recent meeting of Flambeau's board of directors. Mr. Coy has been sales manager of Flambeau, with offices in Chicago, for over fifteen years. During that time he has not only produced an excellent volume of business but found time to take a leading part in the activities of the Salesmen's Association of the Paper Industry, and of other associations working for the betterment of the paper trade. Jim is also well known for his ability to shoot holes-in-one on any old golf course, for his job as "singing master" for the SAPI's and for his genial and forceful personality. His son, Jim, Jr., is following in the footsteps of his Dad, now working under the guidance of H. R. Knott in the offices of the Eastern Manufacturing Company in Chicago.

William J. Miskella is the new president of the Paper Foundation, according to word received from that organization's headquarters at 2433 South Damen Avenue, Chicago. The Foundation will again promote the paper industry at the forthcoming Century of Progress Exposition in Chicago. Mr. Miskella is director of research for the Mid-States Gummed Paper Company and also designed the 1933 Foundation exhibit and supervised the creation and erection of the House of Paper, which featured the Fair display of the industry. Mr. Miskella is a former president of the Finishing Research Laboratories, engineers and publishers of scientific books, in which capacity he supervised the purchase of many carloads of book paper and directed all details in connection with the publication of books. He is the author of "Practical Color Simplified," the authorship of which made Mr. Miskella internationally known as an authority on color. It is announced that the Paper Foundation is carrying on in every way to make the 1934 display of paper and paper products in Chicago even more outstanding, interesting and educational than the exhibit of 1933 which attracted over a million guests.

The Hanchett Paper Company, well known Chicago coarse paper firm, has recently purchased the W. A. Root Paper Company of Elgin and sent P. E. Leonard to that city to supervise the new acquisition. Mr. Leonard is a veteran paper man, having been an executive of Hanchett for over twenty years.

Russell F. Brachvogel, Central Western representative of the Mid-States Gummed Paper Company, of Chicago, announces to his many friends that for the purpose of simplicity and easy understanding he has changed his name to Russell F. Vogel.

The Swigart Paper Company gives considerable attention this week to Madison E. F. Book, announcing it in a special mailing as "an inexpensive book paper with real value" and describing it as of "bright white color, good finish, opacity and bulk."

The J. W. Butler Paper Company is reported to have established a "finer papers" department under the direction of Gene Hammer, which will permit special attention to the promotion of Strathmore, Beckett, Buckeye, Hurlbut and other lines handled by Butler. The "fine paper" line will distinguish the above grades from the regular fine paper department.

The Mid-States Gummed Paper Company has prepared a 64-page book, well illustrated, describing "110 New Gummed Paper Suggestions." The variety of uses for gummed paper are admirably described and three colors are used to give an attractive appearance to the book.

Philadelphia Paper Market Conditions Improve

Volume of Sales of Practically All Standard Grades of Paper Gradually Increasing, Following Comparative Slowing Up of Business Through Heavy Snow Storms—Position of Paper Stock Market Unchanged, With Prices Running Steady to Firm

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., March 5, 1934—While the duration of the blizzard gave evidence that there was a comparatively slowing up of paper trade business, there is reported a gradual increase in volume, and virtually all grades are enjoying a betterment.

So far as could be learned, very little or no change occurred in the waste paper market. The undertone in prices remained fairly firm; true enough, most reports told of consuming mills purchasing in a reserved manner and certainly in lighter tonnage than during busier periods, yet supplies continued to reach the market in limited quantity and one factor seemed to offset the other, with the result that ruling prices were fully maintained.

Paper Trade Association Meets

At the meeting of the Philadelphia Paper Trade Association, there was a large attendance, occasioned by reason of the debate on a number of complaints against various members for alleged infractions of trade rules, as well as the Code. The officers of the association had expected an influx of protests due to misunderstanding of the detailed provision of code operation together with the fact that every paper salesman in this territory has taken on himself the burden of policing its enforcement. After giving these grievances a thorough airing the details of code procedure were explained, and while the Division seemed opposed to dropping the filed complaints, it is unlikely that any further steps will be taken for the present. Financial affairs were discussed at some length, due to increased activities of the organization as well as the enlarged membership presenting problems in balancing income and expense.

William A. Hentz, former president of the association, was given a hearty welcome, this meeting being the first occasion of his appearance since becoming sales manager of Thos. W. Price & Co. on February 1. He was his same loquacious self, imparting much information of a constructive nature, but expressed deep regret that because of his new post requiring all of his time for the present—he would be unable to accept the appointment offered him by the Division as chairman of the important Writing Paper Committee.

A meeting of the Board of Governors took place on March 1 at which matters of general interest were discussed. The Credit Association of the Philadelphia Paper Trade Association met in regular session on Tuesday last. All were unanimous in manifesting their satisfaction with the success that has resulted from the establishment of this credit plan, which is conceded to be the best of its kind.

National Paper Box Program

Howard P. Beckitt, commissioner of the National Paper Box Manufacturers' Association, with headquarters in the Liberty Trust Building, announced that this association has placed in motion a program destined to lend unqualified support to the NRA. At a recent meeting of the Code Authority of Set-Up Paper Box Manufacturing Industry, which took place at the above address, the following members of the Code Authority were present: Wm. P. Datz, Jr., chairman; Walter E. Trum, D. H. Dillard, R. H. Ritchie, J. A. Garvey, Howard P. Beckitt, executive secretary; Sol A. Herzog, counsel; W. Clement Moore, manager, Cost Department; and Francis K. Lowthorp, assistant deputy administrator, Paper and Pulp Division, and administration member of the Code Authority.

Executive Secretary Beckitt reported that the Estimating Manual and Chart of Accounts had been distributed to all members. Mr. Beckitt said that approximately 350 questionnaires had been received and that a number of concerns had asked for additional time. The Code Authority is of the opinion that members of the industry are not complying satisfactorily with the provisions of the Code requiring reports, and on motion duly made, the following resolution was adopted:

> RESOLVED, that the executive secretary take action immediately to see that all members of the industry who have not already reported on the questionnaires, turn in their figures immediately, and if the Profit and Loss and Balance Sheets are not ready, wage and other data should be furnished immediately.

Chairman Datz reported that representatives of the Glazed and Fancy Paper Code had been invited to meet with the Code Authority, but as their Code Authority was holding its first meeting, it was impossible. He stated that it was desirable that close cooperation be had between Code Authority of suppliers and the Paper Box Code Authority.

George H. Snyder headed a delegation of forty manufacturers from Philadelphia that appeared before the Code Authority, and expressing his pleasure in presenting a delegation composed of representatives from practically the entire Set-Up Paper Box Industry of the City of Philadelphia, added that he was glad to have the opportunity of extending their appreciation of the result of the efforts that brought about the accomplishment of the Code under which their industry is now working.

News of the Trade

David Weber & Co., manufacturers of corrugated paper boxes, is negotiating for the construction of an additional one-story factory building, with 8,500 additional square feet of floor space, at Richmond and Tioga streets, and will employ ten additional workers.

Penn Paper and Stock Company have just been awarded contract from Judson-Detweiler Company, of Washington, D. C., for the entire accumulation of waste for an indefinite period. Judson-Detweiler Company is one of the largest printers in the east. This contract was formerly handled by the James Flett Corporation, of Chicago.

H. M. Bailey, of the Hemingway Company, 828 North Hancock street, chairman of the Entertainment Committee for the 29th annual banquet of Waste Paper Merchants, to be held on Saturday evening, April 14, in Penn Athletic Club, has, associated with him on this committee, James O'Neill, of P. O'Neill & Co., 406 South 6th street; A. K. Brigg, Gloucester Paper Stock Company; William Lemly, of William Lemly, 307 Cherry street, and Max Cohen, of Keystone Wiper and Supply Company, 1308 North 3d street, and plans are under way for a very elaborate program.

S. L. Willson Reviews Association Activities

As I look back upon the year 1929 when I was first chosen as president of the American Paper and Pulp Association, and during the succeeding years, I am greatly impressed with the changes that have taken place in business conditions, in mental attitudes and in ideas of co-operation. Within that period, we have experienced a business depression the like of which was never known and one which I sincerely hope may never recur. As a result of the changes in industrial conditions, nearly all associations suffered through loss of membership and of financial support, and the American Paper and Pulp Association was no exception. The problem of our association was to continue its activities, to keep members and even those who for prudential or other reasons dropped membership informed of the current conditions within the industry, with an income of less than one-third of that of 1929. I want to take this opportunity of expressing my personal appreciation of the loyalty of those in charge of our association for the sacrifices made by them during that period by cheerfully accepting drastic cuts in salaries and added hours of work and whose faith in the ultimate usefulness of the association made it possible for a quick reorganization on the basis of federated groups or divisions such as exist today, when the conditions were ripe.

A year ago today the association was disintegrating. It seemed almost an impossibility to keep it in existence, and yet it was realized that even if it ceased to exist, six months would not elapse before another organization would be created, for our industry cannot be without a central association. The distress in which industry found itself was the seed that later took root and became a sturdy oak with its branches developing through proper cultivation.

Resumé of Past Year's Work

I want to make a resumé of its activities during the past year and a half. I should say the first signs of regeneration took place when a meeting of the Book Paper Manufacturers met at a get-together meeting in Spring Grove, Pa. This meeting was called for the purpose of having the manufacturers become acquainted with each other. From those contacts there developed friendships and confidences, the result of which was, at a subsequent similar meeting, an exchange of ideas pertaining to the disastrous competitive conditions existing within that group, which conditions were paralleled in other groups. Finally an organization was effected. What it has accomplished for its own group is well known. It became a model for other divisions and has been a bulwark of strength in building and supporting our present organization.

Shortly thereafter the Kraft Paper Manufacturers Association was reorganized; the Sulphite Papers Division was strengthened and in rapid succession other groups formed cooperative agencies. These, together with the Writing Paper Manufacturers Association, which had maintained its activities continuously throughout the depression, gave a new impetus to the industry's central organization which resulted in the rebirth of the American Paper and Pulp Association.

When the National Industrial Recovery Act was pending in Congress, it became apparent that for an industry to properly function under its provisions, it must do so through an association representing a large majority of those connected with the industry. To say that I was pleased at such a condition is to express it mildly. It was the goal for which I had long hoped. In August a general meeting was called by the American Paper and Pulp Association for the purpose of discussing reorganization and executives from many branches of the industry attended.

Reorganization Effected

It was the unanimous opinion that the reorganization should be predicated upon a federation of divisions and resolutions were passed to that effect, with authority to the American Paper and Pulp Association to prepare Constitution and By-Laws upon that idea. Shortly thereafter, another meeting was called at which the new Constitution and By-Laws were submitted and approved, and the reorganization effected through the election of officers, and the creation of a Board of Governors. The members of the industry have reason for satisfaction in the selection by the Board of Governors and in securing acceptance as members of the Executive Committee by the type of men who now compose it. The industry is indeed fortunate to have a group of men who not only represent the whole gamut of products, but who do so upon an equitable geographical basis. This Executive Committee under the General Code of Fair Competition was selected as the agency for administering the provisions of the Code and was designated as "The Paper Industry Authority." At present the Paper Industry consists of nine members and a chairman. At this meeting I hope it may be the pleasure of the Board of Governors to elect a tenth member as provided under the Constitution and By-Laws of the American Paper and Pulp Association.

In order to eliminate confusion or complication in its activities as an administrative agency only and apart from the activities of the Executive Committee of the American Paper and Pulp Association, the Paper Industry Authority prepared and approved its own Constitution and By-Laws by which it is now governed.

As Chairman of the Paper Industry Authority, I want to say to the Board of Governors that you made no mistake in the selection of the men composing it. It is a pleasure to sit in the meetings and know that every statement, every argument and every act has back of it the thought of "How can we help the paper industry?"—and free from selfish company motives.

Many Protracted Meetings Held

Between August and the time of the approval of the General Code many meetings were held, protracted meetings, some lasting past midnight, with a full attendance at most of them, and with many of the members neglecting their own business for the benefit of the entire industry. I am making these statements because I want every one present to realize that the provisions of the Code are taken seriously and further because I want to impress you with the necessity of having your co-operation in seeing that its provisions are lived up to.

There is a responsibility upon all of us, particularly as officers and members of the association. Our influence should also be used to sell the benefits of the Code to each member of our respective companies and to the officers and members of those companies belonging to your group. You should go even further—sell your salesmen and get them to sell its benefits to those to whom they sell. One of our troubles in life is a lack of understanding. I don't mean a lack of intellect, but a lack of knowledge of conditions, of benefits, of methods and means, and of other factors that will clarify the situation. I want again to urge each one of

* Presented at the meeting of the Board of Governors of the American Paper and Pulp Association, Waldorf-Astoria, New York, February 22, 1934.

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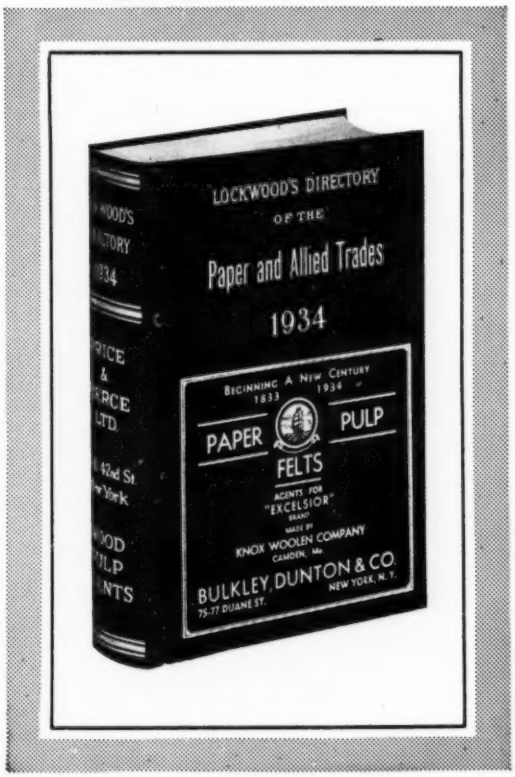

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you to study the Code religiously as a parson studies his Bible.

Code Finally Approved

The code in its final form came up for hearing September 14 and was finally approved and became law on November 27. To immediately have it operative became a momentous task, and it is easily seen why misinterpretations might develop because in the hurried formation of the Code many conditions were overlooked—which again is a case of lack of understanding. When the Code was finaliy approved, the Paper Industry Authority immediately started to make it effective. The following committees were appointed to handle certain phases of the necessary work:

Finance
Statistics and Cost
Labor
Production and Classification
Trade Customs and Fair Trade Practices
Compliance
Marketing
Pulpwood and Conservation
Tariff

The Chairman of each Committee is a member of the Paper Industry Authority and other members of the respective Committees were selected from the industry at large in order to secure a better contact and a broader knowledge of the problems that might arise in the various Divisions.

I have asked the Chairman of each of these Committees to give you a brief summary of the work done by them.

General Results Obtained

I shall not attempt to go into further details because I want to say a few words about the general results thus far obtained through the provisions of the Code. It must be remembered that less than three months have elapsed since it became effective.

It has practically eliminated cutthroat competition.
It has served to stabilize prices.
It has increased the numbers employed.
It has increased purchasing power.
It has developed cooperation.
It has developed horse-sense.
It has made people think.
It has developed confidence.
It has placed our industry on a higher plane.

It has created a knowledge of the fact that the success of any one Division is dependent upon the success of the entire industry.

A year ago Industry, as it were, was in a quagmire of quicksand—how to extricate itself became the problem. President Roosevelt, realizing that emergency methods must be devised to bring those in the pit to the top or from sinking lower, conceived the NIRA. It furnished the means by which industry was to save itself. A chain, as you all know, is composed of many links—and it is just as strong, and only as strong as any one link. These links in the paper industry represent our twenty-four divisions, each of which must see that its link is properly forged, of equal strength to the other links and so joined together that it will serve as a life-saving equipment.

In conclusion, I want to express my appreciation to the members of the Paper Industry Authority for the very unselfish and very unusual services they have given and also to express a like appreciation to the Board of Governors for their help to the American Paper and Pulp Association through their influence in their respective Divisions.

I forecast a bright future for our industry. I am unable to conceive of any level-headed business man throwing away the opportunity to protect his own business through failure to give complete cooperation with the Code Authorities. If this is done, it means success—if it is not done—well, I am not going to harbor any such thoughts. It has got to go in spite of the ax and the chisel.

Awards on Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 5, 1934—The Government Printing Office has announced the following paper awards.

The Whitaker Paper Company will furnish 20,000 pounds (200,000 sheets) of 20½x29, 75 per cent rag white antique laid book paper at 12.5 cents per pound. The Butler Paper Corporation will furnish 10,000 pounds (140,000 sheets) of 21x32, green sulphite writing paper at 5.33 cents per pound and the same company will furnish 10,000 pounds (308,000 sheets) of 21x32, yellow sulphite manifold paper at 9.25 cents per pound. The Aetna Paper Company will furnish 71,750 pounds (500,000 sheets) of 32x42 white sulphite bond paper at 5.33 cents per pound. Bids for all of these items were received on February 7.

Barton, Duer & Koch Paper Company will furnish 300,000 pounds of manila calendered tag board in 34-inch rolls at 7 cents per pound. The same company will also furnish 20,000 pounds of 24x38, 50 per cent rag white bond paper at 14.06 cents per pound; 5,000 pounds of 24x38, salmon, 25 per cent rag bond paper, 10,000 pounds same yellow, 28x34 and 6,400 pounds, same 22x34, pink all at 12.61 cents per pound. Bids for all of these items were received on February 5.

The Whitaker Paper Company will furnish 40,000 pounds (56,000 sheets) of No. 70, 21½x32½ chip board at .018 cents per pound and also 36,000 pounds (36,000 sheets) of the same No. 50, 28½x34½ at the same price, bids for which were received on February 9.

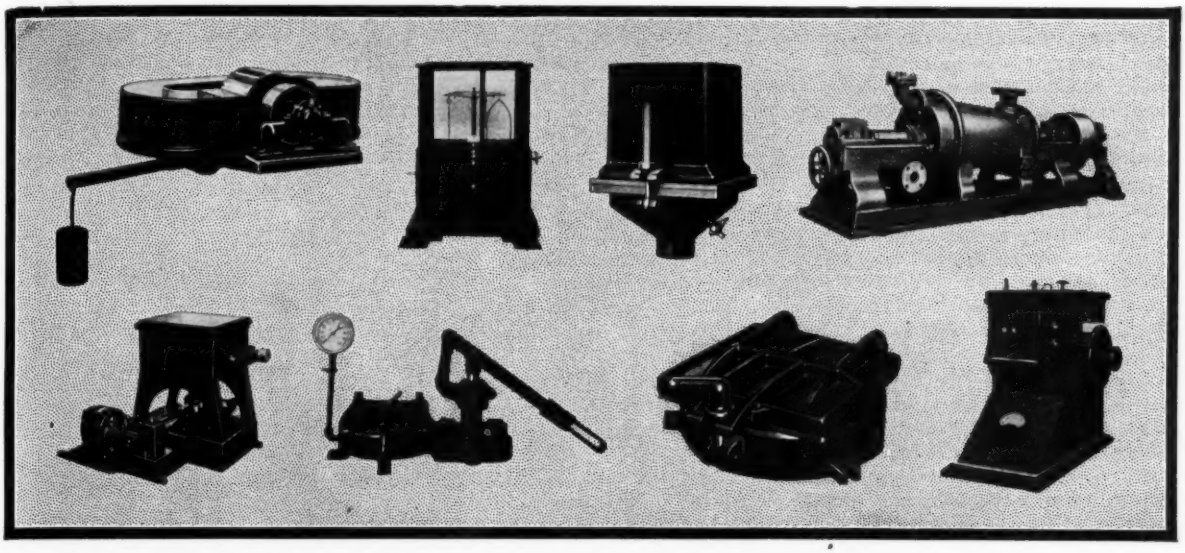
The R. P. Andrews Paper Company will furnish 57,500 pounds (500,000 sheets) of 32x42—115, blue sulphite writing paper at 5.72 cents per pound. Barton, Duer & Koch Paper Company will furnish 18,905 pounds (80,000 sheets) of 44x60 and 30x40, 75 per cent rag lithograph finish map paper at 17.26 cents per pound. The Whiting Paper Company will furnish 50,700 pounds (475,000 sheets) of blue, salmon, and pink 25 per cent rag bond paper at 12.6 cents per pound. Bids for all of these items were received on February 14.

R. P. Andrews Paper Company will furnish 182,000 pounds (1,500,000 sheets) of various sizes white sulphite writing paper at 5.72 cents per pound, bids for which were received on February 16.

To Provide Means of Flood Control

Water power interests and paper manufacturers of the Fox River Valley have joined with the Association for the Relief of High Water and government engineers in asking an appropriation of $6,000 from Congress with which to draw up a reservoir plan as a means of flood control and assurance of a uniform flow of water through the numerous dams along the river all year around. Government surveys for the flood control plan were completed last fall in respense to agitation for some method of ending the 25-year feud between the manufacturers and riparians. It is now agreed that one large storage reservoir on the upper Wolf river will provide a sufficient remedy, because enough water can be impounded to keep Lake Winnebago, the main storage source, at a constant level. It is believed the appropriation will be granted as an emergency measure to provide employment.

Safeguarding Your Future



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NO mill can afford *not* to look ahead. Things may be "sailing along" smoothly today, but tomorrow may present a different picture.

Competition is constantly introducing something new. Quality standards are ever-changing. New, improved products are ever-appearing. The whole paper industry is in a constant state of progress and advancement.

The burden of meeting these changing conditions falls upon your laboratory. Here's where, behind closed doors, you can experiment with new products, new processes, improvements in quality, savings in production, etc., without the costly procedure of going through your mill. Here's where you can carry on a permanent program of creative development and assure yourself a firm position in the field of present and future competition.

Your laboratory, in other words, is your key to progress. Check it up. Talk to your chief chemist. Make your laboratory a *miniature mill* where accurate tests comparable to actual mill runs can be made. Write for full information.

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1933 Developments in Electrical Equipment for Paper Mills

By H. W. Rogers[1]

In an industry as old and progressive as the pulp and paper industry, it is to be expected that developments will generally be confined to improvements in existing machines or equipment, improvements which will increase production, improve quality, reduce cost, or tend toward greater simplicity and flexibility, rather than involve absolutely new ideas.

A number of improvements in paper mill equipment have been made during the year, the most promising of which are: First, electrical aid to the mechanical-driven cylinder machine; second, adjustable voltage winder drive with constant tension control; third, synchronous wood chipper drive; and late, thrustor-operated paper cutter control.

Auxiliary Wet-End Drive

One of the most modern aids to the cylinder type paper machine is the auxiliary electrical drive for the various wet-end sections of the machine which are connected by a common felt. The general practice has been to drive the entire wet-end from the first press section through the felt, acting as a belt which necessitated using a felt having extreme strength in order to stand the pull. This heavy felt had poorer water removal qualities than a more open lighter weave which might have been used if strength had not been a factor. Wear was rapid as a result of the continual stretching so that the felt cost per ton of product was a serious item.

Electrical drives have been designed to relieve the felt of its tension, but they usually consisted of motors connected through gears to the cylinder molds and to the primary presses. In cases where the drive for the remainder of the machine was not electrical, the auxiliary motors received their power from a generator, belt driven from the machine line shaft.

Inasmuch as the wet-end of the machine was started by means of a clutch with the line shaft running at normal speed, considerable attention to the accelerating characteristics of the auxiliary motors was required so that they would accelerate with the proper speed relationship to the main press and not throw undue strain on the felt.

[1] Industrial Engineering Dept., General Electric Co.

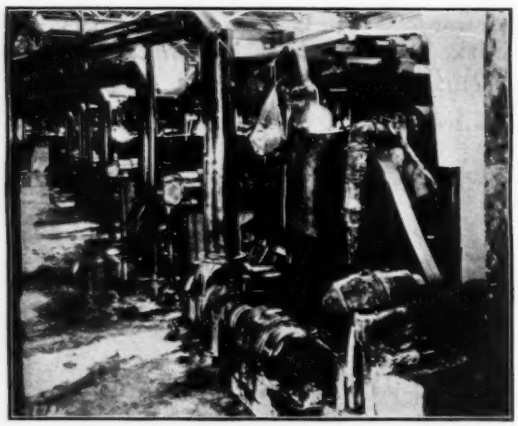

FIG. 1.

Gear-motors driving cylinder rolls and suction rolls on wet end of board machine.

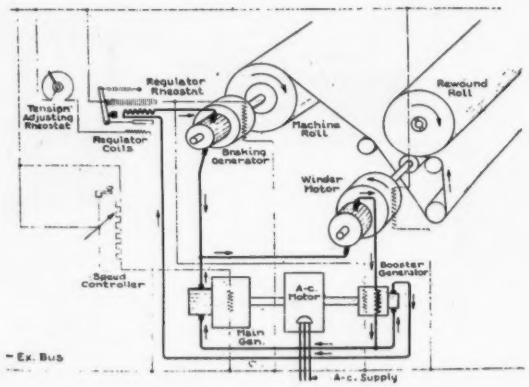

FIG. 2.

Schematic diagram of variable voltage winder drive with regenerative braking tension control.

In the most recent drive at the Bogalusa Paper Company (Fig. 1), an unusual method of supplying power to the auxiliary motors is used. The generator supplying the current is driven from the first press shaft so that when the section is at standstill this generator is at standstill and at any operating speed the speed of the motors is directly proportional to the speed of the generator and the press section.

An exciter motor generator set is required to supply excitation to the motors and to the generator and an additional low voltage generator is supplied as a part of this set. This generator has its armature connected in series with the main generator, driven from the first press section, and as it rotates continuously at constant speed, it supplies the voltage in the circuit required to counteract the resistance drop in the armatures of the generators and the motors.

Thus by exciting this low voltage generator at standstill the auxiliary motors may be caused to exert the normal value of torque and maintain this torque during acceleration and normal running. The voltage generated by the rotation of the main generator armatures will balance the counter emf. of the motor armature at all speeds, leaving the resistance drop to be balanced by the voltage generated in the low voltage generator.

Operating data already show a material reduction in felt replacement costs on this machine.

Adjustable Voltage Winder Drive

In the use of electrical regenerating braking systems for the unwinding stand of paper machine winders, the maintenance of proper tension in the paper as it goes into the winder contributes materially to improving the characteristics of the rewound roll. It also serves to eliminate maintenance and avoid the loss of the power dissipated in mechanical braking.

The new equipment (Fig. 2) gives cushion starting, complete control of operating speed with good speed regu-

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DYESTUFFS DIVISION, WILMINGTON, DELAWARE

lation at any speed, and substantial operating economy in the power consumed.

The braking effect on the unwinding reel is obtained by connecting to it through a gear reduction a generator whose armature output is fed back to the armature circuit of the winder motor. The current returned by this braking generator is proportional to the tension in the paper as it passes between the unwinding reel and the winder drum. A current regulator is utilized to regulate the field of the braking generator as the reel changes in diameter, so that the current output of the generator is maintained constant.

Tension may be obtained in the paper with the winder at standstill and when operating at very low speed in starting a new roll.

For this operation, an auxiliary low voltage generator is supplied as a part of the main motor generator set. The armature of this booster generator is connected in series with the braking generator and has a voltage capacity just sufficient to compensate for the resistance drop in the armatures of the braking generator and the winder motor. Thus, excitation of this booster generator causes the current to circulate between the braking generator and winder motor and creates tension in the paper.

The use of this booster generator eliminates the necessity for a winder attendant holding back on the winder rolls to keep slack out of the paper as the winder is being started and also assists materially in obtaining a firm centered roll as the winder starts up.

The control is so arranged (Fig. 3) that the braking generator may be operated as a motor in either the forward or reverse direction, thus eliminating considerable manual work on the part of the attendant in carrying the paper forward to the winder.

Power readings indicate that in addition to the benefits resulting from maintaining constant tension, the equipment provides considerable power saving as approximately 50 per cent of the current taken by the winder motor is returned by the braking generator.

Synchronous Wood Chipper Drive

In spite of the trend toward the use of synchronous motors on all machines which can be driven at constant speed, the severe mechanical duty to which the wood chipper drive motor must be subjected, together with the exacting electrical requirements, have delayed their application to chippers.

The chipper itself consists of a heavy steel disc with radial knives, usually four in number. In order to change the cut of the knives, it must be possible to move the disc and the shaft back and forth in the direction of its axis and maintain uniform clearance between the knife and the feeding-in spout. The chipper load varies over a wide range and consequently the motor must have high pull-out torque. If the motor pulls out of step, the control equipment must permit resynchronizing on the squirrel cage winding.

All these operating characteristics were provided for in the design of the direct-connected chipper motor (Fig. 4), a number of which have been put in operation recently. The stator stacking is longer than the rotor stacking by an amount equal to the maximum movement required for knife adjustment. This allows adjusting of the rotor and disc longitudinally without disturbing the stator on the chipper base. A steel bracing ring supports the stator coils and each coil is laced to this ring. The squirrel cage winding is designed to withstand heavy mechanical shocks,

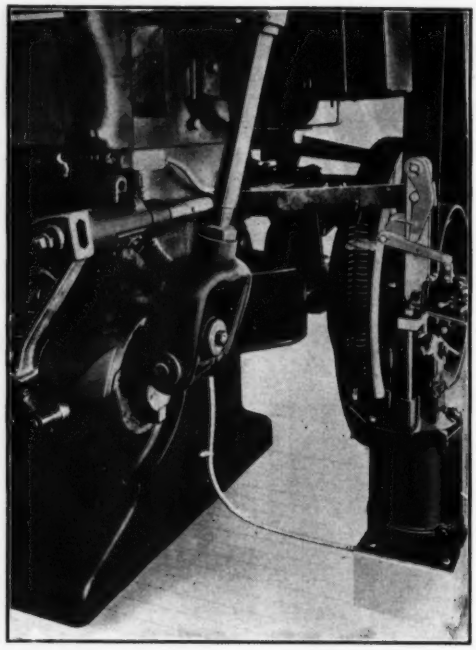


FIG. 5.
Thruster-operated paper cutter.

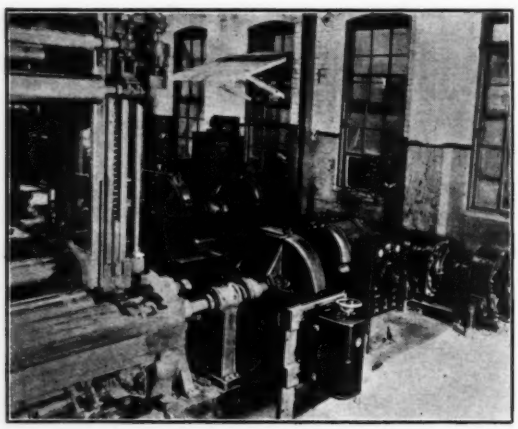


FIG. 3.
Variable voltage winder drive with regenerative braking tension control.

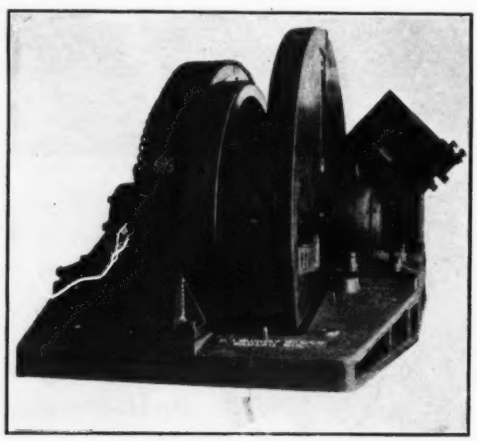


FIG. 4.
200 hp. synchronous motor direct-connected to wood chipper.

and at the same time it has a high heat storage capacity to provide for accelerating the disc and a high pull-in torque to permit resynchronizing under load.

The use of welded frame construction facilitates special design to fit existing chipper bases.

Thrustor Operated Paper Cutter

An electrical equipment has been developed to provide maximum protection for the operators of guillotine type paper cutters; a Thrustor being arranged to engage the clutch mechanism which connects the knife to the flywheel and motor.

Between the Thrustor and the clutch mechanism (Fig. 5) is a link with a solenoid operated latch. The solenoid maintains the latch in the closed position and the Thrustor closes the clutch against the pull of a powerful spring. Two push button stations must be closed simultaneously so that both hands of the operator are occupied while the cut is being made. If the operator removes one or both hands from the push buttons, the solenoid is de-energized, the latch released, and the knife stopped.

Cam operated limit switches make it impossible for the cutter to repeat its stroke, even if the operator maintains his hands on the push button stations. The operator cannot block out one push button station and operate the cutter with the other one; it is necessary to release each push button station at the top of the stroke before another stroke can be made.

Paper Men Get Patents

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., March 5, 1934—Frank M. Sanger, of this city, is the inventor of a shaking mechanism for fourdrinier machines on which a patent has just been awarded. Rights have been assigned the Bagley & Sewall Company for manufacturing purposes. Application for patent was made nearly two years ago. The invention is described as follows: "In a paper making machine, the combination with a frame section mounted to have a shaking or vibratory movement, a rotary member provided with a weighted part arranged off center, means for rotating the member, and connections between the member and the frame sections for effecting a vibratory or shaking movement of the latter."

A patent for the invention of a pulley has also been awarded to Charles W. Valentine, Peter N. Ottersland and George A. Fairbanks, all of this city. Manufacturing rights have been acquired by the Bagley & Sewall Company, of which Mr. Va'entine is president. The invention as described states that the pulley is "a combination with a shaft of a pulley loosely mounted on the shaft, the pulley having a one part hub, arm flanges and rim, the rim and flanges being integrally formed and the hub separately formed and means for fastening the flanges to the hub, the hub having an internal oil chamber closed by bearing at the ends of the hub and means in the chamber for evenly lubricating both bearings when the pulley is running."

Menasha Fiber Products Co. Formed

Articles of organization of the Menasha Fiber Products Company, Inc., have been filed with the secretary of state. The company will be located at Menasha, Wis., and is to "manufacture, produce and sell at wholesale and retail composition plugs, paper products, paper supplies, milling equipment, and supplies and sundries.

The company is capitalized at $3,000, the capital stock consisting of thirty shares with a par value of $100 each. The articles were signed by K. F. Lawson, Menasha, Wis., and Florence I. MacDonald and K. Jean Boone, both of Wild Rose, Wis.

Waste Dealers Nominate Officers

The nominating committee of the National Association of Waste Material Dealers, composed of Clarence B. White, Isadore Cohen and Nathan Kurtz with H. S. Goldstein, advisory member, has submitted the following nominations which will be acted upon at the annual Meeting, to be held at the Hotel Astor, New York, on Wednesday, March 21, 1934, at 2:00 P.M.

For President: George Birkenstein, S. Birkenstein & Sons, Inc., Chicago, Ill.

For Directors for Two Years: David Charak, Federal Paper Stock Company, St. Louis, Mo.; Ezra Frankel, Frankel Bros. & Co., Rochester, N. Y.; Harry S. Goldstein, L. Goldstein's Sons, Philadelphia, Pa.; Maurice Goldstein, American Wool Stock Corporation, New York, N. Y.; Samuel Greenfield, Samuel Greenfield Company, Inc., Buffalo, N. Y.; David Golub, Charles Harley Company, San Francisco, Cal.; Louis Lippa, Apex Smelting Company, Chicago, Ill.; J. M. Maher, Pennsylvania Wood and Iron Company, Buffalo, N. Y.; Julius Muehlstein, H. Muehlstein and Company, Inc., New York, N. Y.; Wm. J. McGarity, Penn Paper & Stock Company, Philadelphia, Pa.; F. H. Nott, Richmond, Va.; A. B. Letellier, Letellier-Phillips Paper Company, Inc., New Orleans, La.; John Fegley, White Bros. Smelting Corporation, Philadelphia, Pa.; Stuart B. Sutphin, The I. V. Sutphin Company, Cincinnati, Ohio; J. C. Winter, Winter Paper Stock Company, Cleveland, Ohio.

For Directors for One Year: Samuel Appel, Samuel Appel Company, Fort Wayne, Ind.; Harry B. Grevnin, National Smelt. and Refining Company, Detroit, Mich.; Milton Levenson, Roxbury Iron and Metal Company, Boston, Mass.; Jacob Stovroff, Buffalo Waste Paper Company, Buffalo, N. Y.

The Twenty-first annual banquet of the association is to be held at the Hotel Astor, New York, on the evening of Wednesday, March 21.

Printing on Gummed Paper

One of the most complete booklets to be published on the printing of gummed paper is now being distributed among printers, label specialists, and lithographers by The Gummed Products Company, Troy, Ohio, makers of Trojan Gummed Paper, Trojan Box Tape and Sterling "Tread" Gum Tape.

This booklet establishes a new precedent for frankness and sincerity in discussing with the printer the various fundamentals essential for best results from this class of work.

Some of the subjects covered include: choosing gummed paper for the job; the handling of gummed paper in the stockroom, in the cutter, and before and after printing; how to print in the simplest manner, printing on the gummed side; humidity and how to control it; and numerous other helpful hints that will assist the printer to understand gummed paper better.

The title of this booklet is "Printing on Gummed Papers," and is available to any printer, label specialist or lithographer requesting a copy on his business stationery.

R. B. McDougall Leaves Collins Mfg. Co.

HOLYOKE, Mass., March 5, 1934—Roland B. McDougall who resigned as assistant sales manager for the American Writing Paper Company, Inc., a year ago to take a position as sales executive for the Collins Manufacturing Company of North Wilbraham has resigned from that position.

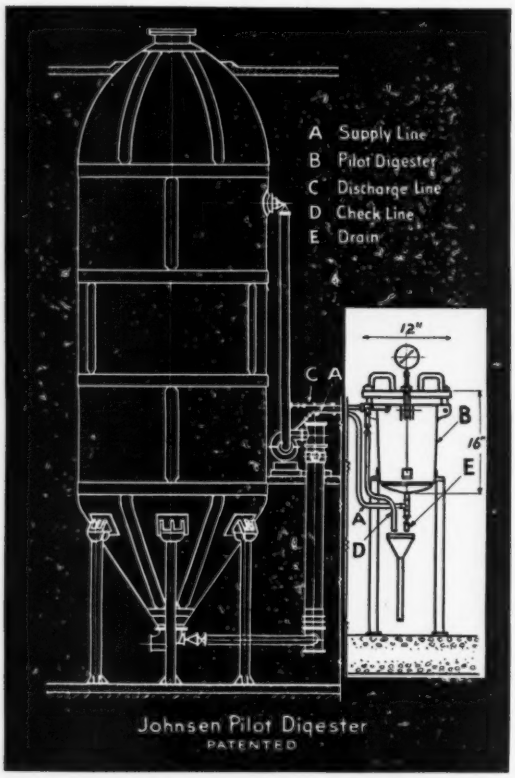
The Pilot Digester

A long felt need for an accurate method of determining the yield and quality of chemical pulp has been filled by the Pilot Digester invented by Dr. Bjarne Johnsen, director of laboratory of Hammermill Paper Company.

The Pilot Digester consists of a cylindrical vessel containing a basket for chips and is connected to the circulating line of the large digester between the suction and the pressure side of the pump.

Operation

One thousand grams of chips representing an average of chips in the large digester are placed in the basket inside the Pilot Digester and the cover bolted on. Moisture test



SKETCH OF DIGESTER INSTALLATION WITH PILOT DIGESTER

is made on a separate sample of chips. When the large digester starts, the valves connecting the Pilot Digester with the circulating line are opened and the acid flows from the pressure side of the pump through the basket back to the suction side of the pump. At the end of the cooking time, the valves are shut, the cover removed and the basket taken out. The pulp is then washed and, if desired, bleached and weighed. The moisture content is determined and the per cent yield is calculated from the dry weight of chips and the dry weight of the pulp.

The quality of pulp produced in the Pilot Digester is sufficient for determination of bleaching quality, beating quality and strength and for chemical analyses.

It has been found in practical operation that the physical and chemical characteristics of the pulp obtained in the Pilot Digester are identical with those of samples taken from the blowpit of the same cook. This proves satisfactorily that the pulp throughout a digester equipped with forced circulation is uniform and also that the yield figure calculated from the Pilot Digester represents the yield of the large digester.

Uses

Determination of yield and quality has already been described.

There is considerable variation in the cooking quality of wood from different sources and of different species. When the mill is to change over to a wood of unknown cooking quality this can be established by using the Pilot Digester without experimenting with the large digesters. Before the change is made the new wood is cooked in the Pilot Digester under the cooking conditions in use and the degree of cooking determined. According to the hardness or bleaching quality obtained the temperature curve for the new wood is adjusted up or down.

In studying various phases of the cooking process the Pilot Digester is of great value especially to mills which are not equipped with experimental digesters or autoclaves, because it is possible at any time to shut off the Pilot Digester and remove its contents for inspection and analysis.

The illustration presented herewith shows the Pilot Digester applied to a sulphite digester with circulation, for kraft and soda digesters with circulation the application would be the same. For digesters without circulation the Pilot Digester can also be used by discharging a small stream of liquor from the Pilot Digester.

The Pilot Digester is patented in the main pulp manufacturing counntries, the exclusive sales rights in those countries are acquired by Fibre Making Processes, Inc., Chicago.

Bound Volumes of NRA Codes For Sale

NRA Codes of Fair Competition approved under the National Industrial Recovery Act are being compiled in bound volumes and can be purchased through the Superintendent of Documents, Government Printing Office, Washington, D. C., at a price of $1.50 per volume.

The Codes are aranged in chronological order, with Amendments, Supplemental Codes, Executive Orders and Administrative Orders and, it is believed, will in this form facilitate the reference needs of industries and persons directly affected by code developments and be of value to all who are interested in following the progress of industrial codification.

Volumes One, Two and Three have just been received, the NRA has announced. The first volume runs from July 9, 1933 to October 11, 1933. The second is from October 12, 1933 to November 10, 1933 and the third covers November 11, 1933 to December 7, 1933. Subsequent volumes will be issued as they are prepared by the Code Record Section of the Recovery Administration.

Thomas J. Leggee Ill

[FROM OUR REGULAR CORRESPONDENT]

HARRISONVILLE, N. Y., March 5, 1934—Thomas J. Leggee, superintendent of the Harrisville Paper Mill, is seriously ill at his home here. He has been suffering from heart trouble for some time and recently underwent hospital treatment in an effort to improve his condition. His condition has interfered with his business duties, but his many friends are hopeful that he will soon be fully recovered.

Obituary

James W. Toole

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., March 6, 1934—James W. Toole, aged 81, once one of the best known paper mill men in the country, but retired several years ago, died early Sunday morning at the Hotel Nonotuck where he had made his home since his retirement. He was born in Dalton October 22, 1852, son of James and Hannah (Oliver) Toole, his parents coming to this country from Ireland when young. His father was a skilled papermaker and was in charge of all the Crane mills of Dalton.

After attending the public schools, including two years at the Dalton High School and a few terms at a private school, Mr. Toole entered the employ of Zenas Crane and worked up through the various departments, obtaining first-hand knowledge of processes that were later to stand him in good stead. The mill burned down in 1878 and Mr. Toole took charge of a small mill in Cummington for two years, returning to be machine tender in the Byron Weston mill at Dalton, where he remained three years.

He came to Holyoke in 1881, being interested with Julius H. Appleton in the erection and management of the No. 2 Riverside mill as it was called, the mill being largely planned by Mr. Toole. This, with the other Riverside mill, was taken over by the American Writing Paper Company on its organization in 1899 and he was made general superintendent of all the mills.

Later the superintendency of the mills in the "combine" as it was commonly referred to, was divided, William Reardon being given charge of the "book" mills and Mr. Toole of the fine writing and ledger mills. Mr. Toole was the staunchest of Republicans and one of his choicest memories was the reception tendered to him on his return from the Congressional convention of this district. It was held at the Holyoke Club and the committee in charge included Holyoke's best known papermakers.

Mr. Toole was a member of the Holyoke Common Council in 1886, and of the Board of Aldermen in 1878. He married August 2, 1879, Miss Eva M. Vining, of West Cummington. He leaves two sons, James A. and Julius H., of this city; one daughter, Mrs. A. W. Nason, of Springfield; one brother, Charles, of Dalton; one sister, Miss Ida E. Toole, of Springfield; two grandchildren and one great-grandchild.

Abraham Lincoln Neumann

Abraham Lincoln Neumann, oldest living employee of the Zellerbach Paper Company, passed away in San Francisco on January 20, 1934. Mr. Neumann was born in San Francisco on March 4, 1866. As a young man he worked for Phil Fruhn, a stationer. Anthony Zellerbach had opened a paper store in a basement on Sansome street in 1876. Abe Neumann thus came in contact with him as he was attending to some business for the stationer. Through this acquaintanceship, Mr. Neumann was employed by Anthony Zellerbach and was his second employee.

Mr. Neumann was receiving a salary of $60.00 a month from the stationer, and while the job with Anthony Zellerbach would only pay $40.00 a month, he elected to make the change believing there was a future in the paper business. It was not long before he was receiving $50.00 a month and then a $5.00 raise each month. The business continued to grow and in the '80s, Jacob C. Zellerbach and Isador Zellerbach went to work for their father, later on the firm becoming A. Zellerbach & Sons.

Mr. Neumann was a salesman for a number of years and later was made purchasing agent because of his knowledge of paper that he had acquired over these many years. He was a great student of his business. Give him a sheet of paper, he would look at it, feel it, tear it, taste it and come pretty close to telling you the actual ingredients of the sheet. Considering the fact that he had been in the paper business for 23 years before he saw it actually made, his faculty was most uncanny in that he could not only tell the contents of the sheet of paper, but he could tell who was the manufacturer of it. He was rated for years as the best paper expert on the Pacific Coast. In 1931 Mr. Neumann was transferred to the Los Angeles Division as assistant manager to direct the sale and purchases of the printing papers. He held this position until a partial retirement in 1930, and in 1931, having completed almost 44 consecutive years with the company, he was retired on pension. In his many years in the paper business he developed a wide circle of acquaintances in the paper industry and he was well known by practically every manufacturer of paper in the United States.

He took a very active interest in the business—in fact he was so engrossed in it that he would prefer to work on Saturdays and holidays rather than take time off as the other employees did. One of his strong traits was to help the younger men in the business, instilling in them a love for the paper business and showing them how to acquire a knowledge of it. Any of the salesmen with a paper problem could always go to Abe Neumann and get it solved.

When informed of the passing of Abe Neumann, one of the old-timers said: "So Abe is gone. The paper industry loses one of its most beloved characters. His traits were a good example for anyone to follow. His word was as good as his bond. He was a stickler for promptness and accuracy and he certainly loved the paper business."

The funeral services were conducted by the Masonic Order. He was a member of the Los Angeles Lodge, No. 42, F. & A. M., Los Angeles Consistory Scottish Rite Masons, and a member of Al Malaikah Temple of the Shrine. Mr. Neumann is survived by his widow, Mrs. Rita Mathilda Neumann, and two sons, Albert Neumann of the San Francisco Division of the company, and George Neumann, with the Sacramento Division. The composite years of service of the father and two sons with the company are 81 years.

Richard J. Freeman

Richard J. Freeman, aged 48, retired paper merchant, active in church and civic affairs, died recently at his home, 316 Summit Avenue, Wayne, Pa. Mr. Freeman had been ill recently and death followed a heart attack. Mr. Freeman, until his retirement a few years ago, was a partner in the paper firm of Matthias & Freeman, of Philadelphia, Pa., and was formerly associated with his father in the Pioneer Suspender Company.

He was a trustee and superintendent of the Sunday School of Wayne Methodist Episcopal Church, former president of the Kiwanis Club, a member of the Penn Athletic Club and trustee of the Methodist Hospital.

His wife, Mrs. Ruth Mullin Freeman, and four sons survive. Funeral services were held at his home, with burial in Laurel Hill Cemetery.

Charles Spiegelhalter

Charles Spiegelhalter, chief engineer of the Pusey Jones Corporation, died in an Atlantic City hotel at 4:45 o'clock Friday, February 16, four days after being stricken with pneumonia. He was 47 years old.

Mr. Spiegelhalter, a resident of Wilmington, Del.,

motored to Atlantic City the previous Saturday with his wife, Mrs. Marie V. Spiegelhalter, for a rest. He had a slight cold when he left. At the shore resort the cold became more severe and on Monday following developed into pneumonia.

He is survived by his wife, his parents, Mr. and Mrs. Andrew G. Spiegelhalter, of Wilmington; two stepchildren, Miss Elizabeth Gallagher of Wilmington and John Gallagher of California; two brothers, Andrew G. Spiegelhalter, vice-president and works manager of the Pusey Jones Corporation, and Matthew Spiegelhalter; two sisters, Miss Laura Spiegelhalter of Wilmington and Mrs. Ray Watson of Pennsylvania.

Mr. Spiegelhalter had been associated with the Pusey & Jones Corporation for twenty-five years. He was born in Wilmington on April 10, 1887. He was a member of Westminster Presbyterian Church for many years. He also was a member of the duPont Lodge, No. 29, A.F. and A.M.

William H. Williamson

GLENS FALLS, N. Y., February 26, 1934—William H. Williamson, assistant treasurer and auditor for several years of Finch, Pruyn & Co., died recently at his home in this city. He had been prominent in paper making circles during virtually his entire career and he was widely known throughout Northern New York. Among the prominent paper mill men who served as honorary pall bearers at the funeral obsequies were Morris Hoopes, F. B. Chapman, L. F. Hyde, Byron J. Lapham and Samuel Pruyn.

Alfred M. Watts

Alfred Miller Watts, of 412 Chichester Lane, Ardmore, Pa., Philadelphia representative of the Cherry River Paper Company, died recently at his home.

Mr. Watts, who was 43, was the son of Charles A. and the late Caroline H. Watts. He was a member of the Princeton Club of Philadelphia, and the Merion Cricket Club. In addition to his father, he is survived by his wife, Mrs. Adelaide Collins Watts, and two sons, David M. and Stephen C. Watts.

Harry De Witt Thomas

The officers and directors of the Parker, Thomas & Tucker Paper Company, Chicago, Ill., announce with profound sorrow the death of its president, Harry De Witt Thomas, on Saturday, February 24.

Coty Bag Machine Company Busy

WATERTOWN, N. Y., March 5, 1934—The Coty Bag Machine Company is experiencing unusually good business conditions and recently completed an order for the Bemis Brothers Bag Company, which operates several branches throughout the country. The new machine is of a highly improved, double bottomer type for putting on ends of multiwall pasted valve bags and a demonstration was given prior to shipment to one of the branch factories. Construction of a second machine of the same variety for the same concern is now under way and will be ready for shipment soon. Both machines are of the regular brand but incorporate improvements based upon recent research and newly patented features of the concern. These new features allow the production of a wide range of sizes and varieties of bags, some of which are considered entirely new and superior to the former ones. It is understood that the minimum production calls for about 80 bags a minute and maximum about 150 bags. Officials of the company believe that the machine will be in great demand because of its flexibility of production.

Labor Board Settles Paper Case

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 7, 1934—A signed agreement settling the dispute resulted from the hearing last week by the National Labor Board on the case of the Grand-City Container Corporation of New York City, and the National Container Corporation of Long Island City, New York. Francis J. Haas sat for the Board. There appeared for the employees: Charles Vonie, Business Representative of Paper Box Makers' Union. For the employers there were present: Louis Rosenfelt, Vice-President and Chairman of the Board of the National Container Corporation; A. H. Israel, General Manager of National Container Corporation; Irving Dorfman, Secretary of the Grand Corrugated Paper Company; Myer Stein, employee of the Grand Corrugated Paper Company; E. R. Phillips, of Stevenson, Jordan, Harrison, Managers of The Container Association of Greater New York.

The case came to the Board from the New York Regional Labor Board after refusal of the employers to comply with recommendations of that Board. A local of the Paper Box Makers' Union, affiliated to the American Federation of Labor, was organized by employees of the Corrugated Paper and Corrugated Box Manufacturers in New York last September and October. After fruitless negotiations a strike began on November 11, which was called off on November 22 on assurances that there would be no discriminations. Charges of discrimination against five strikers were made to the New York Board. On January 24 an agreement was made by the employers and employees for the reinstatement of the five strikers as well as for the sharing of work between those who had refused to strike, the strikers and those hired during the strike. The New York Board held a hearing February 5 on complaint that this agreement was being violated and the Board recommended that all workers taken on after the strike should be replaced by the strikers. The company having refused to reinstate the strikers, the case came to the National Board for hearing today from which resulted the following agreement:

1. The reinstatement of five striking employees, namely, Irving Epstein, John Ruff, Carmen Garitano, Joseph D'Agostino, Philip Zimmerman, is settled upon the following terms:

A. Carmen Garitano and Joseph D'Agostino shall be reinstated on or before March 10, 1934, provided that they apply for reinstatement within that period.

B. Irving Epstein shall be reinstated if he was on the payroll of the company at any time within six weeks prior to the strike, provided, however, that he was not dismissed for reasonable cause.

C. Philip Zimmerman shall not be reinstated at this time, in view of the fact that he has obtained other employment. Should such other employment prove to be temporary, the company agrees to provide him with permanent employment. This provision shall not be binding upon the company after September 1, 1934.

2. All of the five striking employees, including John Ruff, who are reinstated, shall, not later than April 1, 1934, receive the same rate of compensation as was paid prior to the strike.

3. No discrimination in the distribution of work or otherwise shall be practiced upon any employee by reason of his union activity.

4. No union activity shall be carried on on the company's premises during company time.

5. Any question of interpretation or application of this agreement shall be referred to the National Labor Board for decision.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

New York, N. Y.—The Wallace Paper Box Corporation, 132 Mulberry street, manufacturer of paper boxes and containers, has leased a floor in the building at 609-19 West Fifty-first street, and will occupy for new plant. It is proposed to expand present capacity and facilities at the new location.

St. Louis, Mo.—The Cupples-Hesse Envelope and Lithographing Company, 4173 North Kingshighway, manufacturer of commercial envelopes and other paper products, has concluded negotiations for acquisition of former plant of the Monarch Metal Weatherstrip Company, 5020 Penrose street, adjoining its present factory, and will remodel and equip for new plant, developing large increase in present capacity. At a later date, further expansion will be carried out. With this acquisition, the Cupples-Hesse Company will abandon plans, previously announced, for construction of new three-story plant unit, and for which L. Haeger, 3844 Utah place, St. Louis, was architect. Company was formerly known as the Hesse Envelope and Lithographing Company.

Utica, N. Y.—The Industrial Rayon Corporation, West 98th street and Walford avenue, Cleveland, Ohio, manufacturer of cellulose rayon products, is reported planning establishment of a new branch mill at Utica, where it is proposed to take over existing mill buildings, remodel and improve. It is understood that project will mature at early date. Company is completing plans for a new large addition to main plant at Cleveland, reported to cost over $200,000, with equipment. Proposed to ask bids on general contract in near future. Christian, Schwarzenberg & Gaede, 1836 Euclid avenue, Cleveland, are architects. Hiram Rivitz is president of company.

Winchester, Va.—The Shenandoah Paper Board Company, Inc., is considering early rebuilding of portion of one-story storage and distributing building at plant, recently damaged by fire. An official estimate of loss has not been announced.

Franklin, Ohio—The Franklin Board and Paper Company has approved plans for extensions and improvements in power house at mill, including installation of new equipment. Company has let contract to the Babcock & Wilcox Company, Cincinnati, Ohio, with headquarters at New York, N. Y., for certain equipment, including boiler, stoker, superheater and accessories. Other awards for piping, breeching, etc., will soon be made. Collins Wight, Union Trust Building, Dayton, Ohio, is consulting engineer. Edward Fitzgerald is plant superintendent.

Greenville, Miss.—The United States Gypsum Company, 300 West Adams street, Chicago, Ill., has begun operations in a new building at its insulating board mill at Greenville, to be given over to production of hard fibre insulation products. Working force has been increased, and Greenville plant is said to be giving employment to about 225 men in different departments. The new mill unit will be developed to capacity at early date.

Milwaukee, Wis.—The Consolidated Waste Paper Company, 223 West Oregon street, plans to replace damage to storage and distributing plant at location noted, recently caused by fire. An official estimate of loss has not been announced, but is reported as slight.

New York, N. Y.—Officials of the Robert Gair Company, Inc., 155 East 44th street, manufacturer of paperboard and paperboard cartons and containers, corrugated paper boxes, etc., with plants in different parts of country, has arranged for organization of a new group of subsidiary companies under Delaware laws, to operate as individual units of the business. The different organizations will be known as Gair Shelton Containers, Inc., Gair Cartons, Inc., Gair Thames Containers, Inc., all capitalized at $10,000. For its Haverhill, Mass. Division, a new organization known as Haverhill Boxboards, Inc., has been formed, and for Boston district operations, the Gair Boston Containers, Inc. For its Tonawanda, N. Y. Division, the Tonawanda Boxboards, Inc., has been organized. All of the latter three companies likewise have a capitalization of $10,000.

Baltimore, Md.—The J. E. Smith Company, 6 North Central avenue, manufacturer of paper boxes and containers, has concluded arrangements for purchase of building at 816-36 Leadenhall street, corner of Henrietta street, and will take over and occupy for new factory. Property will be remodeled and improved. It is proposed to carry out considerable increase in present capacity at new location.

Chicago, Ill.—Poster Products, Inc., 3208 Carroll avenue, manufacturer of cardboard and paper specialties for advertising service, has arranged for lease of entire floor in building at 3401 West Division street, formerly occupied by the Clemco Desk Company, and will occupy for new paper converting plant. The lease begins on May 1 next. Company will remove to new location at that time and install additional facilities for increased capacity.

Campbellton, N. B.—The Maritime & Gaspe Pulpwood, Ltd., Campbellton, is considering construction of a new local mill. New unit is reported to cost over $60,000, with equipment. It is understood that work will begin early in the spring. G. MacDonald is general manager, in charge.

PAPER TRADE JOURNAL
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GOVERNMENT PAPER AWARDS DELAYED

The awards on the bids opened last week by the Joint Congressional Committee on Printing for supplying the Government Printing Office with paper for the three months' period beginning April 1, were not made on Monday of this week. While there is no regulation to the effect that the awards must be made on the Monday following the Monday on which the bids are opened, this practice has prevailed for a quarter of a century or more. With the exception of last year when there was a brief delay this writer, in fact, can remember but one instance in which this rule was not followed in that period of time. On this occasion all the bids were rejected because in the estimation of the committee they were too high and new bids were asked. It is specifically stated, however, that the bids in this instance have not been rejected, but the reason for the delay in making the awards is not mentioned.

The prices submitted in the bidding are decidedly higher than a year ago, but this should present no puzzling point. It simply reflects the changing conditions in prices, not only with respect to paper but as regards practically all other commodities in general.

The practical uniformity of the prices as regards the bids made on most of the lots which would be startling only a year ago, also presents no deep puzzle. It also simply reflects the working of the NRA and it will be seen on a little reflection that this, under all the circumstances, is just what might have been expected. While the Paper Authority correctly, we think, takes the position that it can give out no information regarding the minimum prices filed with it under the law a few weeks ago by all the paper manufacturers, it is surmised that the prices regarding which the uniformity exists are these figures. Obviously bids lower than the law allows would have been illegal.

But it is easily understandable how the Joint Congressional Committee on Printing finds itself in an unusual and puzzling position. It would seem from this instance that the old system of awarding the contracts to the lowest bidders is now obsolete. Only the wisdom of a Solomon could suggest offhand what is to be done. Under all the circumstances the Joint Committee cannot be criticized for making haste slowly.

BIG GAINS SEEN UNDER CODE RULES

A distinctly optimistic note is registered in a review just issued by the American Federation of Labor of the past eight months of code control under the National Industrial Recovery Act. According to the review the total income of wage earners for January, 1934, was $566,000,000 above that in January of the preceding year. This, of course, included income from government work.

The survey, however, maintains that the gains under NRA may be nullified and its purpose defeated. Between July and September last, the work week was shortened by five hours, according to the report, decreasing from an average of 43 to 38 hours in 103 industries covered by reports to the United States Department of Labor. In that time more than 1,500,000 were put to work and workers' incomes were increased at the rate of $250,000,000 a month.

Increase in workers' buying power and the upturn in industry and the CWA and PWA programs were accomplished without undue strain on industry, it is said. Also, profits of industrial firms were higher in 1933 than 1932, with Standard Statistics reporting net profits of some $338,698,000 for about 400 companies in 1933 as compared with $4,022,000 in 1932.

After discussing the effect on retail and wholesale business by the increase of workers' buying power, the survey discusses the increased business in automobiles, freight shipments, PWA building and other industries.

Declaring that the purposes of the NRA are in danger of defeat, the report then states that "Industrial codes will be an effective mechanism for control in measure as they succeed in keeping the balance between producing and consuming power and carrying out the stated purpose of the Recovery Act: 'To promote the fullest possible utilization of the present productive capacity of industries, to increase the consumption of industrial and agricultural products by increasing purchasing power, to reduce and relieve unemployment, to improve standards of labor.'

"At present certain developments are threatening to destroy the constructive functioning of NRA in carrying out this purpose. If buying power is to be maintained, labor standards must be kept high. In several cases recently industries have asked and received special permission to lengthen hours of work. This was done at a time when there were unemployed workers available, when 4,600,000 were being supported by work financed from government

funds and 2,550,000 families were on relief. If we are to get business back on a self-supporting basis, increasing production must give jobs to the unemployed, not longer hours to those already at work.

"In a number of industries very long hours are permitted under code provisions in retail trade, retail drugs, retail food and grocery, filling stations, electric railroads and buses, hotels, ice manufacturing, trucking industry and others. Readjustment, badly needed here, would create more jobs.

"Also, there has been a tendency in new codes recently proposed to fix lower labor standards. In many cases very low minimum wages or long hours have been urged.

"More serious is the dilatory enforcement of code labor provisions, particularly Section 7a of NRA. Consuming power will not be maintained if firms find it easy to infringe on minimum wage standards or to lengthen work hours, or to prevent collective bargaining.

"The code authorities meeting in Washington have an opportunity to consider these problems and their meaning to industrial growth in the country generally. Particularly important is the problem of getting the unemployed back to work. Industry could well undertake to shorten hours further, giving first consideration to codes which establish standards above forty hours a week."

In discussing "labor's part," the survey says, the weakening of code labor provisions is dangerous in the present business situation.

"It shows a tendency to abandon the original purpose of NRA and to neglect it," it adds, labor's part in the program. If NRA is to succeed, we must have a strong consumer market now, and for the future, organization of labor that will maintan workers' consuming power and keep labor's return from industry advancing in proportion with that of other groups.

"Experience under codes has proved that it is futile to hope for adequate enforcement of labor provisions in any industry unless workers are strongly organized in a trade union. Organized workers have a very definite function in the NRA program: to maintain and raise labor standards. Unless this function is properly performed, we cannot hope for balanced progress.

"How is labor to play its part? Either workers' trade unions must be recognized and workers have a representative in the councils where industrial policies are formulated (code authorities), or labor will be forced into opposition, with no way to win its rights except by warfare and strikes."

The Effects of Beating on Fibrous Cellulose

The Paper Makers Association of Great Britain and Ireland has recently published the thesis of Dr. J. H. B. Bell on "The Effects of Beating on Fibrous Cellulose." This publication consists of 55,000 words and has 14 graphs and microphotographs reproduced on a duplicating machine. Orders may be placed with the Secretary of TAPPI, 122 East 42nd street, New York. Volumes bound on cloth boards, lettered cost $5 per copy or in an ordinary filing binder at $3.75 per copy, post free. There are but a few copies obtainable and will be distributed in order of requests.

Bagley & Sewall Get Machine Order

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., March 5, 1934—A contract for the construction of a paper making machine has been awarded to the Bagley & Sewall Company, by the Johnson & Johnson Company, of New Brunswick, N. J., and indications for a busy spring season are good. It is understood that some of the former working force will be recalled to work on the new order. Upon its completion the machine will be shipped and used for the production of hospital wadding, sanitary pads and facial tissue. Negotiations are also reported under way with the Russian government for the construction of another large paper machine and some announcement is expected soon. The placing of such a contract with the local concern will necessitate the employment of a large number of workers, but it is understood that obtaining the order depends to a large extent upon credit arrangements between this country and Russia. Within the past few years the local company has constructed a number of paper making machines for mills in Russia and that government is said to have been satisfied. Just now the Russian government is reported placing contracts with other countries for considerable newsprint and other brands of paper.

The annual meeting of the stockholders of the Bagley & Sewall Company was held this month at which the directors were elected. Among those elected were Charles W. Valentine, Edward S. Lansing, Harold W. Conde, Allen M. Perkins and Raymond G. Hannahs.

Port Royal Bids for Export Business

The Port Royal Pulp and Paper Company, St. John, N. B., is making a bid for the European market and a sample of 100 tons of high grade bleached sulphite pulp will go forward as a trial shipment to Belgium, where it will meet competition with the products of the Scandinavian countries. Antoine Lacroix, manager of the company, states that quality and price affords an opportunity for a test to be made of the market overseas and he expresses the hope that when exchange becomes stabilized there will be a market for the St. John product in several parts of Europe. The local mill received the order for the trial shipment from its agent in Belgium following the display by him of samples previously sent. The shipment, which consists of ten separate lots of ten tons each, consigned to different mills in Belgium, represents the first European shipment of pulp from the local mill. It is the hope of the Port Royal mill management that the opportunity has now come to recover at least a portion of the large export trade which Canada has enjoyed in Europe in this commodity prior to the present tangle in exchange. The local management freely expresses the opinion that results will follow from the trial shipment.

H. Reeve Angel Honored

The president of Finland has just conferred upon H. Reeve Angel a signal honor in creating him a Knight, First-class, of the Order of the White Rose of Finland, in recognition of his services to Anglo-Finnish relations over a long period.

H. Reeve Angel, who is widely known and highly respected in European newsprint circles, is managing director of his English company, H. Reeve Angel & Co., Ltd., which is affiliated with H. Reeve Angel & Co., Inc., New York, sales agents in the United States for Kymmene Aktiebolag, the well-known pulp and newsprint paper producers.

How Zinc Sulphide Pigments are eliminating sales problems

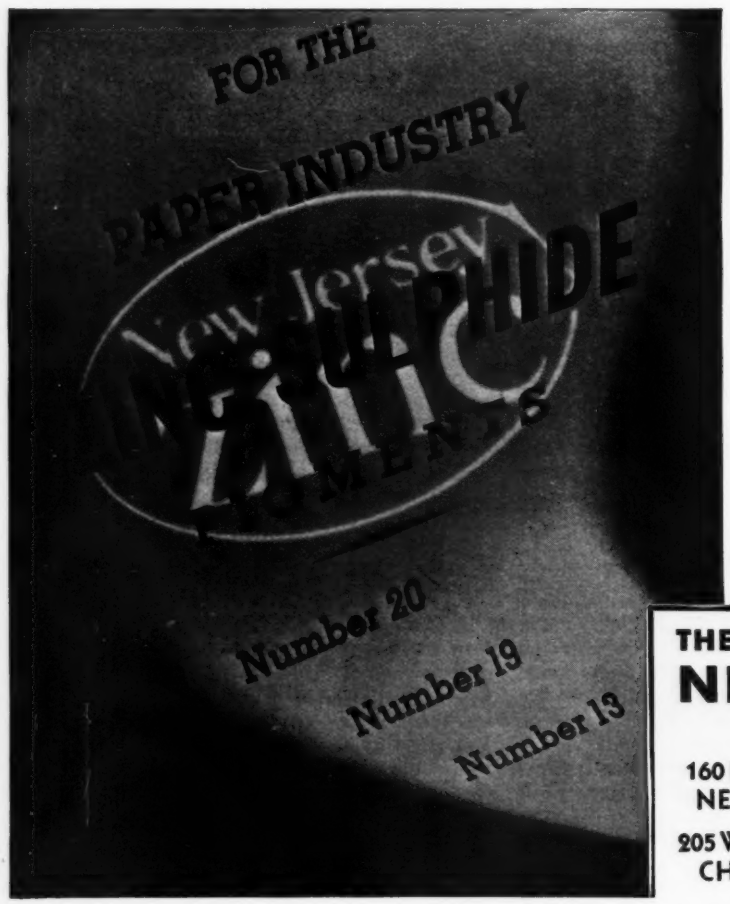
without presenting any unusual manufacturing problems

One Manufacturer required a sulphite bond of better color and brightness together with an increase in opacity . . . **A Zinc Sulphide Pigment did it**

Another Manufacturer required a waxed bread wrap, opaque and bright, at a minimum cost . . . . . **A Zinc Sulphide Pigment did it**

A Third Manufacturer required an 80 lb. offset to match the color and opacity of 100 lb. offset . . . . . **A Zinc Sulphide Pigment did it**

A Fourth Manufacturer required a boxboard with better color at no increase in cost **A Zinc Sulphide Pigment did it**



These are just a few among many manufacturers, many problems

We shall be glad to tell you which Zinc Sulphide Pigment (there are three strengths) is the most economical for your particular problem.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Reprocessing Printed Ground Wood Papers*

By Sidnay D. Wells[1]

Abstract

A new process is described wherein groundwood papers printed with a ink having the iron lake of haematein as a pigment are reused. The ink is removed by the reducing and acid action of sulphur dioxide on the nodulized wet stock. Rod mills are used to prepare the stock for the sulphur dioxide treatment and subsequent washing.

Attempts to completely remove carbon black ink in the past from printed groundwood papers have either been unsuccessful or too costly. Contact with some of these attempts and study of others made it appear desirable in planning the use of reprocessed paper to depend, rather, on the use of paper printed with an ink that was capable of being bleached or discharged. Ink based upon numerous pigments were tried[1] and it was finally ascertained that the iron lake of haematein made the most satisfactory pigment for the purpose when everything was taken into consideration. The ink made therefrom met the requirements of the printer and publisher, it was capable of being discharged and dissolved in acid, and was furthermore capable of being bleached with an oxidizing agent. With the commercial production of the ink arrangements for its use were made with the telephone companies and the printing establishments that print the telephone directories so that a complete cycle was set up and a potential supply of stock sufficient for the needs of the plant was created.

RECEIVED January 31, 1934.

* To be presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 19 to 22, 1934.

[1] Member TAPPI, technical advisor, Combined Locks Paper Company, Appleton, Wis.

NOTE—This paper is presented with the approval of the Combined Locks Paper Company, Combined Locks, Wis.

FIG. 1

Warehouse for four thousand tons of telephone directories to permit continuous operation with periodic collection.

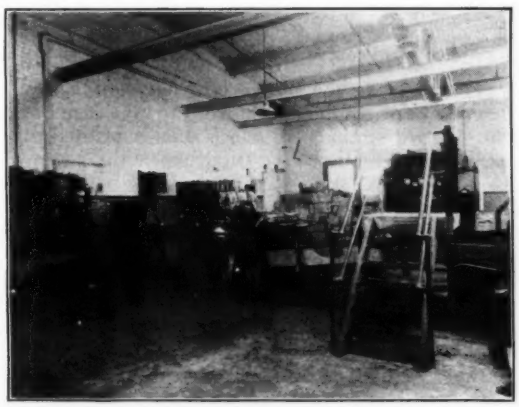

FIG. 2

Back and Cover Remover.

The process used for discharging and dissolving the ink depends upon the dual properties of sulphurous acid as a reducing agent and as an acid. The combination of the two makes it possible to use so small an amount of acid that but 40 pounds of sulphur are required to produce enough acid to treat one ton of paper stock. It is evident that no other deinking agent except water can compete with it in cheapness.

Diffusion Washing

The use of diffusers for washing has been found very convenient and economical. The diffusers not only serve for the removal of the ink but they also form the best absorption system imaginable so that no acid system is necessary. The sulphur dioxide obtained from the sulphur burner is blown directly into the diffusers while they are charged with damp nodules.

It is necessary, however, to nodulize the stock and this is done most advantageously and with the least power consumption by means of rod mills. Two tons of telephone leaves per hour are reduced to nodules with the expenditure of but 90 horsepower.

The nodules must have a moisture content of between 75 and 80 per cent. A Voith pneumatic system blows the stock from two rod mills through four 3-inch pipes at the

rate of 4 tons per hour to the diffusers which are located 60 feet away. The nodulization of the stock makes it possible to wash by diffusion in depths up to 20 feet.

In slush form diffusion washing is impossible because of the impenetrability of the mass by water as shown by the freeness test of between 115 and 135 by a standard Canadian freeness tester. In nodulized form it gives a test of between 600 and 700 or the same as kraft pulp.

Nodulization in rod mills not only offers an efficient method of preparing papers for diffusion washing but it also offers a most efficient method for working up dried paper broke, dry pulp sheets or dried out laps for conversion of the same to slush stock. Working at densities of from 15 to 25 per cent separates the ultimate fibers with the least consumption of power so that the conversion of the nodules to slush will occur with ordinary agitation. Where steam must be used the amount required is inversely proportional to the consistency. Established processes for the recovery of magazine stock can advantageously make use of the rod mill with considerable saving in steam and equipment.

Process and Equipment

The plant built for the recovery of telephone books consits of two lines of equipment in order to take care of books made up of two sections of which one is printed on colored paper. Fig. 5 shows the progress of the paper stock through the system.

The books are taken from the cars and are either conveyed to stacks in the storage warehouse or are laid upon a long belt conveyor running almost the entire length of the building. From this conveyor they are placed by hand into a feeding conveyor which delivers them at a regular and controlled rate to the back and cover remover. This machine, built especially for the purpose, removes the backs and covers and is adjustable so as to take books of any size.

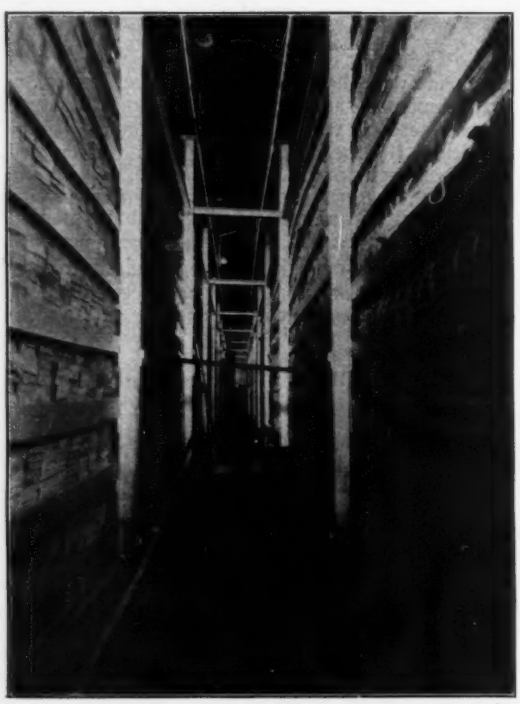

FIG. 3

Tiers of directories in warehouse.

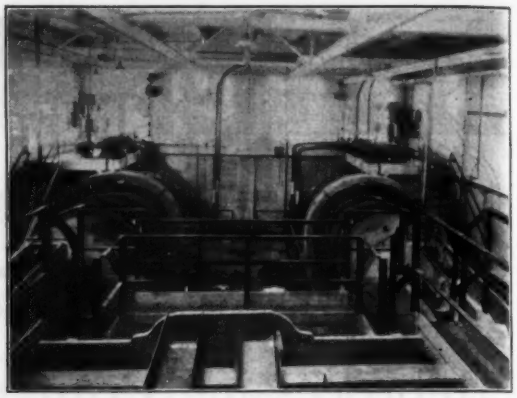

FIG. 4

Rod mills with pneumatic system in background.

On leaving this machine the white leaves are delivered to the conveyor going to one rod mill while the colored leaves are delivered to the conveyor going to the other rod mill.

The nodulized stock is delivered to screw conveyors from which it is taken by the Voith pneumatic system and blown to any one or pair of 6 diffusers located in a building about 60 feet away. These diffusers are wood tanks 14 feet in diameter and 20 feet high. They are provided with a perforated false bottom made of nickel steel alloy such as is used for blow pits and false tops made of perforated sheet bronze, No. 65, such as used for centrifugal screens. The flow of liquor through the diffuser is from the bottom to the top and a maximum discharge is obtained by using the closely perforated sheet bronze for the false top.

Under each line of three diffusers is a concrete wood lined stuff chest arranged like belmer bleachers and provided with circulating pumps. The diffusers hold 15 tons each of stock in nodulized form and the stuff chest the same amount of stock at between 4 and 5 per cent consistency.

The stock is pumped from the stuff chest over rotary filters to remove all trace of acid and from there it is delivered to the paper mill as slush or run into laps for storage.

Before any liquor is run through the nodules they are treated with burner gas piped from a sulphur burner nearby. The gas connections are then closed and strong liquor is pumped into the bottom of the diffuser. It passes up through the stock and through the false top from where it is piped back to the storage tanks. The cycle followed in the operation of each diffuser is as follows:

TO DIFFUSER	FROM DIFFUSER
3 hours on strong liquor	3 hours filling with liquor
3 hours on weak liquor	1 hour to weak tank
21 hours on water	3 hours to strong tank
	2 hours to weak tank
	18 hours to sewer

The liquor to the strong tank will average 6 grams per liter of SO_2 and to the weak tank 4 grams per liter of SO_2. All liquors testing below 2 grams per liter of SO_2 are discharged to the sewer. The course of the paper stock through the recovery plant is shown in the accompanying flow sheet.

Liquor Use and Recovery

The diffuser operation was based on a 27-hour cycle and while the plant has not been continuously operated on that cycle, we have determined that a daily production of 60 tons can be maintained with very satisfactory results if

sulphur dioxide is added to the water during the first 6 hours the diffuser is on water. It has been found possible to obtain sulphur dioxide undiluted with nitrogen by boiling off the sulphur dioxide obtained in the strong liquor leaving the diffuser. Two small sulphite digesters are available and will be made the nucleus of a recovery system arranged along lines shown in Fig. 6 for liquor use and recovery.

Use for Old Digesters

The upper portions of one digester will act as a spray chamber while immersed in the lower portion of this digester will be coils that will act as heat exchangers to recover the heat in the outgoing liquors by heating the incoming liquor. The other digester will be used as a storage tank for sulphur dioxide so that the recovery system can be continuously operated and yet supply intermittent demands for gas. The release of the sulphur dioxide and the neutralization of any residual acidity with caustic soda precipitates the pigment contained in the liquor and this can be removed by the use of filter presses before the spent liquor is discharged to the sewer. With the recovery system installed the distribution of the liquor to each diffuser will be as follows:

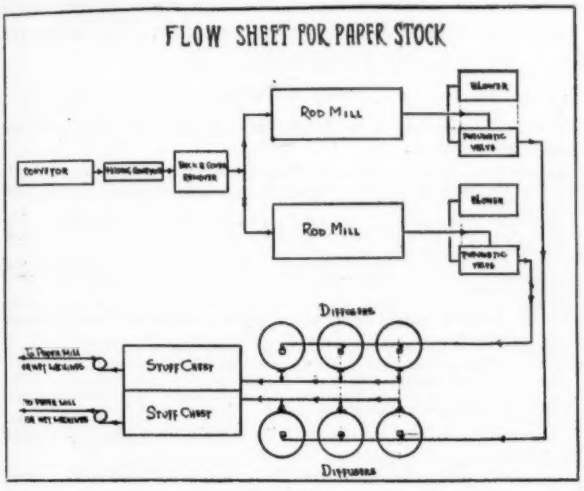

FIG. 5

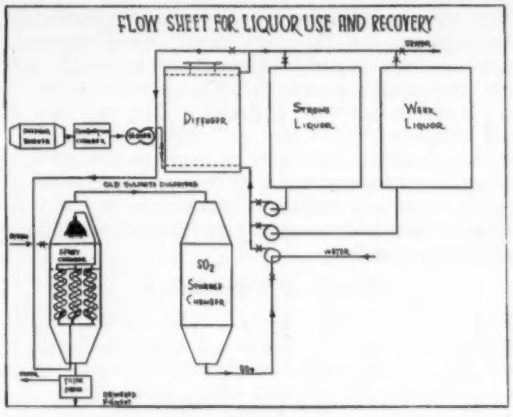

FIG. 6

TO DIFFUSER	FROM DIFFUSER
3 hours on strong liquor	3 hours filling
3 hours on weak liquor	1 hour to weak tank
6 hours on sulphited water	6 hours to recovery
15 hours on water	3 hours to strong tank
	2 hours to weak tank
	9 hours to sewer

By the use of this procedure all possibilities for contamination of the pulp from slight traces of pigment will be avoided.

A Conservation Measure

The paper recovery system described above has been in use now for considerably over one year and it has been found to offer a very satisfactory source for fibrous material. Telephone books in the larger cities in the territory from Omaha to New York City and north of the Ohio River are now printed with inks based upon a pigment consisting of the iron lake of haematein and the recovered directories are shipped directly to the Combined Locks Paper Company. Our national inventory of fibrous stock has thereby been considerably increased and could be further increased to an important degree should it become necessary or advisable to do so.

Literature Cited

[1] Wells, S. D.—"A Printing Ink and Method of Discharging from Paper," Chem. Met. Eng. 40, No. 12: 634-637 (Dec., 1933). (Read at meeting of the American Institute of Chemical Engineers, Roanoke, Va., Dec. 13, 1933.)

Water Resistance of Paper Board*

By Philip W. Codwise[1]

Abstract

The author reports on the investigation by the TAPPI Sub-committee on Water Resistance of Paper whereby the dry indicator test is applied to paper board with successful results.

Since presenting its report on "Water Resistance of Paper" at the 1932 annual meeting, your sub-committee on water resistance has extended its investigation to include the heavier paper products such as paper board. It has also done some work upon the thinner but specially processed and water-proofed products.

RECEIVED January 26, 1934.

* To be presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 19 to 22, 1934.

[1] Member TAPPI, chemical engineer, Beaver Wood Fibre Co., Ltd., Thorold, Ontario.

The work upon paper board has, we believe, been brought to a conclusion but further work may be advisable for the specially water-proofed papers. The results upon paper board do not check as closely as did those presented in our earlier report upon the thinner papers, but when it is realized that there are greater difficulties inherent in testing the heavier sheets and that the variables present are undoubtedly more numerous, we feel that the agreement is sufficient. In view of all the factors involved, we are satisfied with the results upon the seven specimens here presented, and believe that the work can form the basis for a standard method for testing the resistance of paper board to water penetration.

Development of Test Method

In developing the method of test for resistance to water penetration of paper board and similar products, it was

felt that we should adhere as closely as possible to the method adopted for the thin beater sized papers. This method was not entirely satisfactory in itself for our present purpose, as it was felt that a more direct application of the water was desirable. The method as developed employs the same dry indicator powder and much of the same equipment as used in the earlier procedure. As here presented it permits of continued observation of the sample without disturbing it in any way and furnishes a reasonably accurate end point for judging the completion of the test.

Details of Test Method

APPARATUS AND MATERIALS: The materials required for these tests are a number of glass cylinders, with ground ends, of 1⅝ inches inside diameter and 1¾ inches high; a number of polished clear glass plates at least 4x4 inches in size; the standard dry indicator powder, together with a suitable shaker; some bees-wax, or its equivalent, and a shallow container in which to melt the same. In addition, there are required some 2-pound weights, water of ordinary purity, a Fahrenheit thermometer, a stop watch, suitable supports and some small mirrors.

The standard dry indicator powder is prepared by pulverizing a quantity of tablet sugar, until it passes a 100-mesh sieve, and placing in a desiccator. Prepare similarly soluble starch and methyl violet dye. When thoroughly dry weigh out the following: 45 grams sugar, 5 grams starch and 1 gram methyl violet. Mix these ingredients thoroughly by repeated sifting, after which the indicator is ready for use; it should be kept tightly sealed when not in use.

PREPARATION OF SPECIMEN: The sample to be tested is cut to size 3x3 inches. A spot upon the polished clear glass plate is sprinkled with the indicator powder equal in size to the area of the glass cylinder and with only a thin sprinkling of the powder; the test specimen is then centered over this spot. The bees-wax is heated until well melted and one end of the glass cylinder dipped in same after which the waxed end of the cylinder is immediately centered upon the sample and weighed with a two pound weight. To doubly assure a tight bond a small amount of the melted wax is poured around the outer edge of the cylinder in contact with the specimen and in order to prevent the external access of moisture to the indicator, the edges of the specimen are sealed to the plate with the wax. When the wax has cooled and hardened, the specimen is ready for test.

PROCEDURE FOR TEST: The test is commenced by starting a stop watch simultaneously with pouring water at exactly 70 deg. F. into the glass cylinder of the prepared specimen to a height of approximately ¾ inches. The assembled apparatus should have been previously placed upon a stand approximately 2½ inches above a mirror placed below in a horizontal position; in this way the dry indicator powder is continuously visible through the glass plate in the mirror below. After pouring in the water the 2-pound weight is again placed upon the top of the glass cylinder in order to assure a uniform contact. The temperature of the water should be checked as the test proceeds and be regulated to exactly 70 deg. F. by adding a small quantity of water of the temperature required. The progress of the test is watched by noting the discoloration of the dry indicator powder and the test is continued until a clear and distinct circular darkened area is present by the turning blue of the grains of the indicator below the area covered by the water in contact with the specimen under test, at which point the watch is stopped. The elapsed time is reported as the water penetration test.

Co-operative Tests

Below are given the results obtained by the different cooperating laboratories upon the seven samples of paper board employed in this work. The instructions sent out with the samples were to season and test them under the standard atmospheric conditions of 65 per cent relative humidity and 70 deg. F. temperature. The necessity of maintaining the temperature of the testing water at exactly 70 deg. F. ±1 deg. F. was emphasized and readings were reported upon the temperature of the water. In the case of certain laboratories tests were done at humidities below 65 per cent and it has seemed advisable not to use these in the tabulation.

The results upon the seven paper boards detailed below were obtained in two different series of tests. The last three samples (V, VI, and VII) were all tested by the exact details given above, as was a sample of waxed paper to be described later. The first four samples (I, II, III, IV) were tested in essentially the same way except that a few of the refinements introduced into the final directions for the test were not used. For instance the mirror was not employed, and the edges of the specimens were not sealed to the glass plate. In other respects the tests are comparable.

Products Tested

We will now give a brief description of the various products tested:—

Sample I is a news board of .025 inch caliper. In this sheet the sizing is chiefly in the interior. It has a low, dry finish and weighs 75 pounds per thousand square feet.

Sample II is a white, patent-coated newsboard of .038 inch caliper. The sizing in this sheet is in the face side. It has a medium finish and weighs 120 pounds per thousand square feet.

Sample III is a solid manila board of .026 inch caliper. This sheet is well sized throughout. It has a high-water finish and weighs 115 pounds per thousand square feet.

Sample IV is a test liner sheet of .016 inch caliper. It is sized in the face side. It has a medium finish and weighs 58 pounds per thousand square feet.

Sample V is a center stock of .054 inch caliper and is sized throughout. It has a low finish and weighs 159 pounds per thousand square feet.

Sample VI is a white, patent-coated manila board of .020 inch caliper. The sizing in this sheet is in the face side. The sheet has a high water finish and weighs 92 pounds per thousand square feet.

Sample VII is a liner stock of .026 inch caliper. It is sized throughout, has a medium high finish and the weight of the sheet is 85 pounds per thousand square feet.

We will now tabulate certain characteristics of these sheets in order that they may be readily compared:

Sample	Kind	Thickness (Inches)	Weight Per M. sq. ft. (Pounds)	Density (Pounds per cubic feet)
I	News board	.025	75	36.0
II	Patent coated news	.038	120	37.9
III	Solid manila	.026	115	53.0
IV	Test liner	.016	58	36.3
V	Center stock	.054	159	34.4
VI	Patent coated manila	.020	92	55.1
VII	Liner stock	.026	85	39.2

Results of Ten Tests

The results given below are the average of ten tests, five taken from each side of the sheet. In the case of boards sized throughout, the tests from the two sides check quite closely, but with products sized on one side only, there is often a marked difference when testing from the two sides and the results are higher when the water is applied to the sized side. This will be treated in detail later in the report. The average figures together with the deviation results are:

Laboratory	Sample I	Sample II	Sample III	Sample IV	Sample V	Sample VI	Sample VII
	Test Results—Average of ten tests in minutes						
	Min.	Min.	Min.	Min.	Min.	Min.	Min.
A	14.75	12.50	30.00	8.00	49.30	12.90	16.65
B	18.00	13.40	36.00	11.00	57.50	16.15	22.40
C	—	—	—	—	66.70	22.00	26.60
D	8.85	8.85	22.90	5.35	54.00	12.80	21.50
E	14.30	11.40	30.10	7.70	65.60	16.90	27.50
Mean result	13.98	11.54	29.75	8.01	58.62	16.17	22.95

PRECISION ANALYSIS

	Deviation from Mean						
	Min.	Min.	Min.	Min.	Min.	Min.	Min.
A	0.77	0.96	0.25	0.01	9.32	3.27	6.30
B	4.02	1.86	6.25	2.99	1.12	0.02	0.55
C	—	—	—	—	12.08	5.83	3.65
D	5.13	2.69	6.83	2.66	4.62	3.37	1.45
E	0.32	0.14	0.35	0.31	6.98	0.73	4.55
Average deviation ...	2.56	1.40	3.43	1.49	6.82	2.64	3.30
Average per cent Deviation	18.3	12.1	11.5	18.6	11.6	16.4	14.4

Grand Average Deviation—14.7%
For the Seven Samples

In order that a more detailed picture may be obtained of the results, we are giving below the figures obtained from the two separate sides of the sheet upon sample V as representative of a sheet uniformly sized throughout and upon Sample VI as representative of a sheet in which the sizing is confined to one side.

	Sample V		Sample VI	
Laboratory	Wire side up	Felt Side up	Wire side up (Face up)	Felt side up
	Min.	Min.	Min.	Min.
A	53.50	45.10	20.30	5.50
B	60.00	55.00	24.50	7.80
C	64.20	69.20	36.00	8.00
D	53.60	54.40	20.10	5.50
E	65.60	65.60	26.40	7.40
Mean Results	59.38	57.86	25.46	6.84
Average deviation	4.68 Min.	7.65 Min.	4.59 Min.	1.07 Min.
Average per cent deviation .	7.90	13.2	18.0	15.7

Figures Checked by Operators

The individual operators had comparatively little difficulty in checking their own figures and results in the report of any individual laboratory do not show any serious trouble in obtaining concordant results. The difficulty is undoubtedly mainly in establishing conditions that are the same in various laboratories and in judging the end point. When it is realized that sizing in paper will change with ageing and with variations in external conditions, we believe that the figures may be considered satisfactory. Samples as sent out were carefully matched and the sets of specimens represented identical sheets in order to eliminate as far as possible variation that might result from differences in weight or other controllable factors.

These results indicate an average deviation result of 14.7 per cent, or, in other words, slightly below 15.0 per cent. This compares with an average deviation slightly below 10.0 per cent in the case of the tests on thin papers previously reported. Considering all factors, we believe that such a deviation is to be reasonably expected in testing paper board.

Specially Treated Papers

An investigation of tests upon water-proofed and specially treated papers has also been undertaken in connection with the paper board work. Preliminary work was done upon oiled kraft paper and asphalt treated papers but these were found to require several days or longer for results by the above method and, therefore, were not suitable for this committee's work. However, co-operative testing was done upon a sample of wet waxed sulphite but there was not a sufficiently close agreement in the results to report upon it at the present time.

Discussion of Methods

In developing the present procedure, the fact has been kept before us that it is for the purpose of a standard method to determine water penetration through the sheet. We have also felt that it was desirable to establish a procedure employing equipment readily available in any laboratory.

The Bureau of Standards has suggested the following method which was tried out by a few of the laboratories in connection with this work and the results obtained indicate that it might serve as an alternative procedure: "The edges of the test specimen, about three inches square, are sealed by dipping into a suitable material such as beeswax, asphalt, or pitch. The indicator powder is now sprinkled on one side and a transparent cover, such as a watchglass or a piece of celluloid, is sealed over it. The coverglass should be somewhat smaller than the specimen and, if the nature of the material will permit it, the edges of the specimen can be bent up so that they will not come in contact with water at all when the specimen is floated. The seal is made with molten beeswax or pitch applied with a medicine dropper around the edges of the coverglass. Beeswax, or preferably beeswax containing a small amount of carnauba wax, will suffice for most materials. In some cases it is necessary to make the seal with pitch in order to prevent the specimen from pulling away from the coverglass when it gets wet. The specimen prepared in this manner is floated on water at a given temperature and a measure is made of the time required for the water to cause coloration of the indicator."

Favorable Reaction

However, the general reaction from the committee members who have done this work is favorable to the method as recommended at the outset of this report. The feeling seems to be that although the proposed standard method requires considerable time in the preparation of the specimens, yet it is the preferable one when all factors are considered.

In a test of this nature, the correct gauging of the end point is undoubtedly the most dfficult feature. However, the directions are quite concise "until a clear and distinct circular darkened area is present." We do not say until a solid dark area is present because it often happens that the penetration at certain spots may be unduly retarded by entrapped air or other causes; neither do we wish to take the first discolored spot because such a spot may be due to a local defect in the specimen and because of the difficulty in definitely determining the first discoloration. The results of this co-operative work would indicate a reasonably close agreement in judging the end point.

It should be mentioned here that this test is based upon water penetration through the sheet and that in a product such as paper board this may in certain cases grade the sheets in a different manner than would a test involving a complete immersion of the specimen in water. As an example, it is evident that the difference in water immersion tests upon samples VI and VII would be much greater than is the difference in the penetration tests. However, this does grade the sheets with regard to their resistance to water penetration and in cases where added information is needed, may be supplemented by a water immersion test.

Conclusion

We believe that the above adaptation of the dry indicator method will prove suitable as a standard method for determining water penetration through paper board, and the same is presented for your approval.

Acknowledgment

The committee members have been most generous in giving their time to this work and we wish to express our appreciation of the assistance given by Miss H. U. Kiely, C. E. Libby, Allen Abrams, F. T. Carson, L. K. Burnett, G. C. Chase and D. A. Cameron, all of whom took an active part in this work.

Rapid Methods for the Determination of Bleached and Unbleached Fibers in Pulp and Paper*

By M. S. Kantrowitz[1] and R. H. Simmons[2]

Abstract

Three rapid methods for the determination of percentages of bleached and unbleached fibers in pulp or paper are outlined. The results of determinations made using these methods and the official Bright stain are tabulated and the factors for and against each method are discussed.

The official method of the Technical Association of the Pulp and Paper Industry for differentiating between bleached and unbleached fibers is known as the Bright stain and is outlined in "Paper Testing Methods," a book published by the association.

This method is based on the affinity of a freshly prepared solution of ferric chloride and potassium ferricyanide for lignified fibers. In this solution the unbleached fibers are stained green while the bleached fibers remain colorless. The fibers are then counter stained with a solution of benzopurpurine 4B concentrated, which stains the bleached fibers red and changes the color of the unbleached fibers from green to blue.

According to the official method the fibers are dried on the slide; stained 20 minutes at 20 deg. C. ± 1 degree in the ferric chloride-potassium ferricyanide solution; washed and then stained 20 minutes at 20 deg. C. ± 1 degree in the benzopurpurine. It can be seen from this procedure that including the drying, staining and washing the method requires at least one hour for completion.

The Government Printing Office purchases annually on contract approximately 50 million pounds of paper of which about 35 million pounds are required to be free from unbleached or ground wood pulp. In addition large quantities of envelopes, illustrations, roll and fanfold forms are purchased, the stock of which must be free from unbleached pulp. This necessitates the testing of approximately 2,000 samples annually for unbleached fibers.

Due to the necessity for testing this large number of samples for the presence of unbleached pulp, it was found necessary to obtain a more rapid method. Three stains were found available; the Malachite Green stain, the Malachite Green-Congo Red stain, and the Modified Bright stain as described by Filz. *(1)*

In studying or developing a rapid method for the determination of bleached and unbleached fibers in paper, the following points were considered:

1. The stain should give the maximum of differentiation between the two types of fibers.
2. The time for staining should be a minimum for an individual determination.
3. The staining should give satisfactory results at the prevailing room temperature.
4. The results should check those obtained with the official Bright method.
5. The stain should be one with which complete staining may be performed on the microscope bench.
6. The fibers should be in such a condition after staining that they may be separated sufficiently on mounting so that the count method may be used in determining percentages of fibers.

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Malachite Green Stain

This method is based on the fact that basic dyes have a strong affinity for lignified fibers and only a slight or no affinity for bleached fibers. This method is used by the Division of Tests and Technical Control of the Government Printing Office when quick and approximate results are desired.

The following procedure is employed:

Solution

One gram of malachite green dye dissolved in 100 cc. of distilled water.

Procedure

For all the methods described in this paper, the fiber suspension is prepared in accordance with the directions prescribed in T.A.P.P.I. Standards. A few drops of the fiber suspension are transferred onto a glass slide, and the excess moisture is removed with a small piece of blotting paper. Two or three drops of the stain are placed on the fibers which are then teased apart. The excess stain is removed with blotting paper. The fibers are then washed with several drops of distilled water. This washing is repeated until all excess stain is removed. The fibers are then mounted in distilled water and a second slide is applied as a cover glass. The slide is examined under a microscope at a magnification of about 60 diameters. The unbleached fibers are stained green while the bleached fibers are colorless. The amount of unbleached fibers in the sample is estimated by comparing with standard slides prepared from known compositions of unbleached and bleached pulps.

Although this method is quick, it is not wholly reliable since no accurate count of the bleached fibers can be made. The determination can, therefore, only be made by estimation or comparison with standard slides of known compositions of unbleached and bleached pulps.

Another disadvantage encountered in using this method is the necessity of sometimes washing the fibers nine or ten times before the excess dye is removed. Generally two or three washings will suffice, but sometimes certain dyes used in the manufacture of the paper cause the malachite green to adhere to the fibers in which case it is difficult to wash the fibers free from the stain.

Malachite Green-Congo Red Stain

In order to obtain a sharp differentiation between the green unbleached fibers and the colorless bleached fibers, Sibert and Minor *(2)* followed the basic malachite green stain (0.5 per cent solution) with a direct dye, using 0.1 per cent aqueous solution of Congo red, the latter imparting a red color to the bleached fibers in contrast to the green color of the unbleached fibers. The procedure involves digesting the fibers 5 minutes in the malachite green solution on a steam bath; filtering on filter paper, washing with water, and then with a 10 per cent solution of ammonium carbonate; then digesting the fibers in the Congo red solution 5 minutes, filtering and washing as before. The staining consumes approximately 30 minutes.

This method was studied in an attempt to shorten and simplify the procedure. The use of malachite green stain alone had shown that it was not necessary to digest the

fibers to get results as the reaction was found to be practically instantaneous at room temperature. The treatment with the Congo red was not as satisfactory and it was found necessary to allow the fibers to remain in contact with the stain for a longer period of time.

The same procedure was followed as that described for the malachite green stain. However, instead of removing the excess malachite green by several washings of the fibers, the Congo red stain was applied to the fibers immediately after blotting up the malachite green solution. The fibers were teased apart, and the Congo red solution allowed to remain in contact with the fibers for two minutes. The excess stain was removed by blotting and washing once with distilled water. The fibers were then mounted in distilled water for microscopic examination.

Determinations were made by this method using various concentrations of Congo red. Aqueous solutions of 0.1, 0.5, 1.0, and 2.0 per cent Congo red were tried. The determinations were made by the count method.

For this work known mixtures of bleached and unbleached coniferous chemical wood fibers were prepared. These mixtures contained 5, 10, 15, 25, 50, and 75 per cent of unbleached fibers, the difference being bleached fibers. A representative portion of each sample was prepared for analysis and marked by code for identification, the code being unknown to the analyst.

Table I gives the results obtained by two analysts using the malachite green stain and the malachite green-Congo red stain.

TABLE I
RESULTS OF ANALYSES USING MALACHITE GREEN AND MALACHITE GREEN-CONGO RED STAINS

Sample No.	Analyst	Malachite Green Stain: Unbleached Fibers %	Error* %	Malachite Green-Congo Red Stain: Concentrations of Congo Red Solutions: 0.1 %	Error* %	0.5 %	Error* %	1.0 %	Error* %	2.0 %	Error* %	Unbleached Fibers by Weight %
1	1	8	+3	4	−1	3	−2	3	−2	3	−2	5
	2	7	+2	6	+1	5	0	4	−1	3	−2	
2	1	8	−2	5	−5	5	−5	5	−5	5	−5	10
	2	14	+4	8	−2	10	0	6	−4	7	−3	
3	1	11	−4	8	−7	8	−7	8	−7	7	−8	15
	2	16	+1	8	−7	12	−3	10	−5	8	−7	
4	1	19	−6	18	−7	13	−12	11	−14	11	−14	25
	2	25	0	22	−3	15	−10	19	−6	8	−17	
5	1	42	−8	37	−13	20	−30	21	−29	19	−31	50
	2	49	−1	23	−27	31	−19	38	−12	10	−40	
6	1	72	−3	53	−22	48	−27	40	−35	45	−30	75
	2	74	−1	48	−27	50	−25	44	−31	45	−30	

*The error is the variation from the percentage of unbleached fiber by weight.

A study of the results in table I shows that malachite green followed by Congo red stains in strengths of 0.1, 0.5, 1.0, and 2.0 per cent applied in accordance with the procedure described above give erroneous results and are, therefore, unsuitable for ascertaining the amount of unbleached fibers present in a mixture of unbleached and bleached pulp.

The results obtained show errors as much as 40 per cent lower than the actual amount of unbleached fibers present in the mixtures. The errors obtained with 0.1 and 0.5 per cent Congo red solutions may be traced to the fact that the bleached fibers are so faintly colored that an accurate count of the fibers is difficult. With concentrations of 1.0 and 2.0 per cent Congo red, errors are due to the red color absorbing or destroying the green color of many unbleached fibers, especially the light green fibers, imparting to them a brownish red color which resembles the color of the bleached fibers.

The 0.6 per cent solution of benzopurpurine 4B concentrated of the official Bright stain was tried in lieu of the 1.0 per cent Congo red solution. It was found that the benzopurpurine solution covered the green color of some of the unbleached fibers. The benzopurpurine solution made up according to that described by Fi'z was also tried, but this, too, was abandoned for the same reason.

Modified Bright Stain

1. Filz Method

As stated earlier in this report, the staining of bleached and unbleached fibers by means of the official Bright method requires at least one hour.

Filz has used a modification of the Bright method with good results. His modification eliminates the excessive time element and the staining is done at the prevailing room temperature. This method is given here for convenience.

Solutions

A. N/10 $FeCl_3$
Dissolve 2.7 grams $FeCl_3$. $6H_2O$ in 100 cc. distilled H_2O.
B. N/10 K_3 Fe (Cn)6
Dissolve 3.29 grams of this salt in 100 cc. distilled H_2O.
C. 0.5 gram of benzopurpurine 4B crude in 100 cc. of 50% ethyl alcohol.

Agitate for a few minutes and allow the insoluble matter to settle. Pour off the supernatant liquid which is ready for use immediately. This solution will keep indefinitely. (The solution appears to be of a colloidal nature, the benzopurpurine existing in a highly dispersed form.)

The ferric chloride and potassium ferricyanide solutions are the same as those of the official Bright method, but the benzopurpurine solution is 0.5 per cent solution of the dye in 50 per cent ethyl alcohol instead of the official 0.6 per cent aqueous solution of the dye.

Procedure

A group of the fibers is taken up with a dissecting needle, placed upon a slide and the excess moisture removed with a blotter. 0.5 cc. solution "A" and 0.5 cc solution "B" are mixed on a watch glass and a drop of the mixture placed upon the fibers. The fibers are then teased apart and allowed to stand for one or two minutes to insure even straining. The excess stain is blotted up, a drop of distilled water is placed upon the fibers to remove excess stain and again blotted. A drop of solution "C" is now added; the fibers are teased apart as before, but allowing a somewhat longer time for staining (from two to three minutes will do). The excess stain is blotted up, a drop of distilled water added to wash the fibers, blotted and finally the fibers mounted in a drop of distilled water under a cover glass. The staining is carried out at room temperature.

2. Government Printing Office Method

The use of Filz modification of the Bright stain led the writers to investigate further possibilities for shortening the time for making the determination. It was found that it is not essential to mix the ferric chloride and potassium ferricyanide solutions previous to applying on the fibers. It is also unnecessary to remove the excess ferric chloride-potassium ferricyanide solution by washing with distilled water previous to applying the benzopurpurine solution. The color develops on unbleached fibers almost instantaneously and the time required in teasing the fibers apart and in removing the excess stain has been found sufficient to give satisfactory results, but for accuracy it is best to allow the stain to remain on the fibers approximately one minute. Equal quantities of the two solutions has also been found unnecessary. The following method of procedure was adopted.

The solutions are the same as those used in the Filz method except the benzopurpurine. The latter is warmed until the dye is completely dissolved.

Procedure

A few drops of the fibers are drawn out from the test tube by means of dissecting needles, placed on a glass slide and the excess moisture is absorbed with a small piece of blotting paper. Two or three drops of solution "A" are placed on the fibers and then followed by an equal number of drops of solution "B." The mixture is stirred and the fibers are teased apart and then allowed to remain in contact with the stain for one minute. The excess stain is blotted up and two or three drops of solution "C" applied and the fibers again teased apart. The fibers are allowed to remain in contact with this stain for about two minutes. The excess stain is removed by blotting and then washing the fibers once with distilled water. The fibers are mounted in distilled water and a second slide applied as a cover glass. The amount of bleached and unbleached fibers are determined by the official count method. The time required for staining is approximately 5 minutes, as compared with approximately one hour by the official method.

The procedure of this method differs from the Filz method in that it does not mix solutions "A" and "B" previous to application on the fibers. It also does not completely remove the ferric chloride-potassium ferricyanide stain by washing with distilled water. Another variation is that this method employs a clear solution of the benzopurpurine while Filz uses a solution of a colloidal nature. It was found that the clear solution of benzopurpurine gives a brighter red color equal to that produced by the official Bright method while the colloidal solution gives a light pink color to the bleached fibers. When the clear solution of benzopurpurine becomes cloudy, it is warmed up until the solution becomes clear again. If the analyst does not desire to clarify the solution after it has become cloudy, he may use the supernatant liquid after the insoluble matter has settled. In this case the coloration of the bleached fibers will be the same as that produced by the benzopurpurine solution employed by Filz. The writers prefer to use the clear solution as the bleached fibers are more intensely colored.

In order to prove the accuracy of the Government Printing Office modification, slides were prepared using the standard samples described above and also three unknown samples. The fibers were stained by the official Bright method, the Filz method, and the Government Printing Office method, and the amounts of bleached and unbleached fibers were determined by two analysts. Table II gives the results obtained.

TABLE II
RESULTS OF ANALYSES USING THE OFFICIAL BRIGHT, FILZ AND GOVERNMENT PRINTING OFFICE METHODS

Sample No.	Analyst	Official Method Unbleached Fibers %	Official Method Error* %	Filz Method Unbleached Fibers %	Filz Method Error* %	Government Printing Office Method Unbleached Fibers %	Government Printing Office Method Error* %	Unbleached Fibers by Weight %
1	1	7	+ 2	6	+1	7	+ 2	5
	2	9	+ 4	8	+3	7	+ 2	
2	1	13	+ 3	13	+3	11	+ 1	10
	2	13	+ 3	12	+2	15	+ 5	
3	1	21	+ 6	13	−2	13	− 2	15
	2	17	+ 2	16	+1	18	+ 3	
4	1	21	− 4	23	−2	24	− 1	25
	2	26	+ 1	27	+2	30	+ 5	
5	1	50	0	46	−4	46	− 4	50
	2	49	− 1	50	0	45	− 5	
6	1	70	− 5	69	−6	70	− 5	75
	2	65	−10	70	−5	65	−10	
7 (a)	1	14		10		15		
	2	16		13		13		Unknown
8 (b)	1	8		6		6		
	2	8		8		8		"
9 (c)	1	21		21		19		
	2	23		26		26		"

*The error is the variation from the percentage of unbleached fiber by weight.
(a) Sulphite writing envelopes.
(b) White tissue paper.
(c) White gummed paper.

A study of Table II indicates that the Government Printing Office method gives results as accurate as can be obtained by the official Bright method.

Summary

1. The official Bright stain requires approximately one hour for staining.

2. The Malachite Green-Congo Red stain developed by Sibert and Minor requires approximately 30 minutes for staining.

3. The method using Malachite Green stain alone requires not more than 5 minutes for staining. This method shows a fair degree of accuracy in the hands of experienced analysts.

4. The Malachite Green-Congo Red stain using various concentrations of the Congo red gives results which are in error. The results given in Table I show lower percentages of unbleached fibers than were actually contained in the standard samples.

5. A determination using the Filz method takes approximately 15 minutes. The Government Printing Office modification eliminates two steps in the procedure and gives results which are fully as accurate as the Bright method.

6. The results obtained using the Bright, Filz, and Government Printing Office Methods (Table II), show a very close relationship. Determinations by all three methods check the known quantities of unbleached fibers very closely.

7. Staining by the Modified Bright stain allows the fibers to be separated sufficiently from each other to permit the use of the count method in determining percentages of bleached and unbleached fibers.

Recommendation

It is recommended that the modification of the Bright stain as employed by the Government Printing Office be considered by the Technical Association of the Pulp and Paper Industry for adoption as an official method for determining the amount of bleached and unbleached fibers in pulp and paper.

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(2) The Differentiation of Sulphite Pulps, Paper 25, No. 21 (January 28, 1920).

Relation of Paper to Printing

Testing is of importance in connection with the definition and evolution of printing paper properties, and the correlation of the properties with results in printing. Satisfactory methods have been developed for measuring some of the properties related to printing quality. The Bureau of Standards, Washington, D. C., developed an instrument for measuring the opacity of paper, and this type of instrument is widely used in the paper industry. The extent that printing will show through paper depends largely on its capacity. The amount of penetration of printing ink into paper apparently bears a close relation to the porosity of the paper, and the Bureau has recently developed apparatus for precise measurement of this property. It is stated, however, that much more research must be done before the printing quality of paper can be completely defined.

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Fillers

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Method of Loading Paper With an Alkaline Filler. Harold R. Rafton assignor to Raffold Process Corp. U. S. pats. 1,897,145 (Feb. 14) and 1,898,098 (Feb. 21, 1933). —*No. 1,897,145*—In the manufacture of paper filled with an alkaline filler, fibrous material and a size precipitant such as alum are mixed and to this mixture there are added size and alkaline filler under conditions limiting the contact of the constituents to a minimum, and paper is formed from the resulting mixture. *No. 1,898,098*—In making paper filled with an alkaline filler by limiting the time of intimacy of the mixing, precipitation such as may result from the reaction of alum with rosin size is effected in the presence of the alkaline filler previous to addition of the latter to the furnish.—A. P.-C.

Paper Manufacture. Harold R. Rafton assignor to Raffold Process Corp. U. S. pat. 1,904,251 (April 18, 1933).—In the manufacture of paper filled with an alkaline filler with addition of material so as to minimize the intimacy or time of contact of the constituents of the mixture, a non-acid aluminum compound such as sodium aluminate is added to prevent stickiness in use of rosin size, etc. —A. P.-C.

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Coating

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The Properties of Paper Pigmented With Zinc Sulphide. Howard M. Cyr. Paper Trade J. 96, No. 24; 31-33 (June 15, 1933).—A discussion of the effects of the use of zinc sulphide on the properties of paper.—A. P.-C.

Opacity and Whiteness Test For Paper Coating Pigments. Harold R. Rafton. Paper Trade J. 96, No. 26; 30-32 (June 29, 1933).—A test is presented, based upon producing a coating of standard weight upon a colored paper with a mixture of the desired pigment and adhesive, and observing the degree to which the colored paper surface is obscured.—A. P.-C.

Barium in Paper Making. Raymond Fournier. Papeterie 55: 666-670, 722-726 (July 10, 25, 1933).—A review of the properties of barium carbonate, sulphate and sulphide, and of their use in the paper industry. —A. P.-C.

Development of Method for Determining Foaming Tendency of Casein. C. W. Richards and L. W. McFail. Tappi Papers 16: 297-298 (June, 1933); Paper Trade J. 97, No. 1: 29-30 (July 6, 1933).—A method for the evaluation of casein for foaming tendency is presented and its accuracy and relation to mill performance are discussed.—A. P.-C.

Starch Coating Composition. Walter R. Schulte assignor to Burgess Battery Co. U. S. pat. 1,911,400 (May 30, 1933).—A dry-cell liner paper has a coating comprising ungelatinized starch and a mixed gelatinized starch and a glue binder.—A. P.-C.

Paper Coating Method. Rudolph C. Germanson and Frederick Kranhold assignors to Paper Patents Co. U. S. pat. 1,918,095 (July 11, 1933).—Coating "color" is applied to the partially dried paper directly on the paper machine, as it is passing through a press placed between two sections of the driers, the "color" being applied directly by one of the press rolls, or by means of a felt passing through the coating bath and then through the press in contact with the paper. If both sides of the paper are to be coated, two such devices are provided.—A. P.-C.

Coating Paper. Charles C. Colbert and George E. Preston assignors to American Coating Mills. U. S. pat. 1,903,325 April 4, 1933).—A preliminary light coat of "clay solution" is applied to the surface of paper, it is then subjected to air drying at room temperature while hanging in folds; then a similar "clay solution" is applied and brushed on the preliminary coated surface and the paper is dried by heated air. An arrangement of apparatus is described.—A. P.-C.

Rubber-Repellent Coated Paper. Harold W. Walker. colloidal-size process frequently gives trouble on coating assignor to The Champion Coated Paper Co. U. S. pat. 1,928,192 (Sept. 26, 1933).—Paper coated with partially neutralized waterglass has rubber-repellent properties and has substantially the same degree of pliability as the uncoated paper.—A. P.-C.

Coating Stock. G. M. Papeterie 55: 774-778, 830-837 (Aug. 10 and 25, 1933).—Stock sized by the Bewoid or varnishing on account of desizing. In the case of coating, this is due to alkalinity of coating "color", which produces saponification of the sizing, because the latter consists practically entirely of free rosin; with the usual sizing process, impermeability is obtained largely by means of aluminum resinate, which is unaffected by the alkalinity which may be present in the "color". The trouble may be prevented by using a strictly neutral "color". In the case of varnishing, the trouble is attributed to the solvent action exerted on the free rosin by the varnish solvent, which has no effect on aluminum resinate.—A. P.-C.

Process and Apparatus for Coating Paper. Theodore E. Knapp, Jr., assignor to The Champion Coated Paper Co. U. S. pat. 1,924,994 (Aug. 29, 1933).—The coating is smoothed by means of one or more rolls rotating in a direction opposite to the travel of the paper.—A. P.-C.

Bleaching

Bleaching Liquor Obtained by Saturation of Milk of Lime with Gaseous Chlorine. Determination of Cellulose in Wood. Korolev and Trofonova. Bumazhnaya Prom. 12, No. 2-3:32-35 (1933).—The method of production of the bleaching liquor was developed in the laboratory. The method for the determination of cellulose with sodium hydroxide and nitric acid is given; it is considered more convenient than that of Cross and Bevan.—C. J. W.

Investigations of Bast Fiber Bleaching. I. E. Kayser. Melliand Textilber. 14, no. 9:455-458 (Sept. 1933).—A study is reported of the new "I. G.-Korte" procedure for bleaching bast fibers and the removal of lignin and pentosans was followed through the steps of bleaching. An acid bleach was used with a pH of less than 5. It is claimed that the action of the bleach is then chlorinating instead of oxidizing and the chlorinated lignin can be removed by an alkaline treatment without injuring the bast fibers.—C. J. W.

Direct Chlorination As An Aid in Bleaching Sulphate and Sulphite Pulps. J. D. Rue and J. S.. Sconce Pacific Pulp Paper Ind. 7, No. 8: 12-15 (Aug. 1933).—Data on the bleaching of two sulphite and two sulphate pulps show the superiority of two-stage chlorine-hypochlorite over single-stage hypochlorite bleaching as regards both the chemical and the physical properties of the bleached pulp.—A. P.-C.

Improving Quality and Manufacturing Processes of Bleached Sulphite Pulp. John D. Rue and James S. Sconce. Paper Mill 56, No. 28: 4-7 (July 15, 1933).—Two-stage chlorine-hypochlorite bleaching of sulphite pulp results in a saving in chlorine and lime, or an improvement in the quality of the bleached pulp, or both.—A. P.-C.

A New Stripping Agent for Colored Rags. L. G. Lawrie and J. G. Evans. World's Paper Trade Rev. 99: 1731-1734, 1768-1773, 1854 (June 9, 16, 1933); Paper Maker & Brit. Paper Trade J. 85: TS142-144, 154-156 (July, Aug. 1933).—The method consists essentially in boiling colored rags without pressure for from 1 to 2 hours with 2 per cent (on the weight of the rags) of decamine (nature not disclosed) in the presence of a reducing agent such as an alkaline hydrosulphite solution. Laboratory experiments showed that this method, applied on the most resistant types of dyestuffs known to the textile industry, is infinitely superior to the usual stripping method used in paper making (boiling under pressure with caustic soda solution).—A. P.-C.

Bleaching Process. The Mathieson Alkali Works. Fr. pat. 742,139.—Bleaching is effected by means of chlorites.—A. P.-C.

Pulp Bleaching Process. The Mathieson Alkali Works. Brit. pat. 380,488 (Sept. 19, 1932).—Chlorites, particularly of alkali and alkaline-earth metals, are used in solution.—A. P.-C.

Treatment of Sulphite Pulp. Hellmuth C. Schwalbe assignor to Dill & Collins Co. U. S. pat. 1,899,989 (March 7, 1933).—In order to obtain a product for high-grade paper, the pulp is subjected to a "prebeating", then to a "prebleaching" and then to digestion (suitably under pressure with caustic soda and sodium chloride).—A. P.-C.

Drying

Advanced Temperature Control of Paper Drying. A. H. Stanton. Paper Mill 56, No. 27: 7-8 (July 8, 1933).—An explanation of the principle of the Thermo-Pressure Compensation system of temperature control in paper driers with an indication of its merits.—A. P.-C.

Determination of Moisture in Paper Sheeting. S. I. Chuvikovski and D. M. Flaythe. Bumazhnaya Prom. 12, no. 4: 37-39 (1933).—Curves and a table showing the efficiency of paper-drying machines of different designs are given.—C. J. W.

New Process For the Moisture Control of Paper. R. H. McKee and J. S. G. Shotwell. Paper Trade J. 97, No. 6: 33-42 (Aug. 10, 1933).—By passing a sheet of paper through an atmosphere containing at least 17 grains of water per cu. ft. at a temperature of about 95 deg. F. the moisture content of overdried paper can be brought up to 8.5 to 0 per cent in about 3 sec. The method has been applied successfully on a commercial machine making 110 tons of news print per day.—A. P.-C.

Removal of Water On the Paper Machine. Anon. Papeterie 55: 729-733 (July 25, 1933).—A brief discussion.—A. P.-C.

Paper Drier. John W. Vedder assignor to Rice,

Barton & Fales, Inc. U. S. pat. 1,919,312 (July 25, 1933).—A pulley is mounted on the end of each drying cylinder, the diameters of the pulleys decreasing progressively from the dry end to the wet end. One of the drums is suitably driven from a source of power, and a belt passes successively around the pulleys. The driving of drier rolls by the belt and by the felt, respectively, are both non-positive, and control each other so that the driers can slip on the felt sufficiently to allow for the lengthwise shrinkage of the paper.—A. P.-C.

Drainage For Paper Machine Driers. Daniel H. Keck assignor to Paper Patents Co. U. S. pat. 1,920,567 (Aug. 1, 1933).—The draining siphon is connected to a substantially vertical discharge leg, having a valve at or near the bottom. At or near the top, the discharge leg has an enlarged portion of a vertical length at least as great as the vertical height of the pipe in the drier, and the portion between the enlargement and the valve is relatively long.—A. P.-C.

Cellulose and Lignin

X-Ray Method for Quantitative Comparison of Crystallite Orientation in Cellulose Fibers. Wayne A. Sisson and George L. Clark. Ind. Eng. Chem. (Analyt. Edit.) 5: 296-300 (Sept. 15, 1933).—The method is based on the assumption that the distribution of the crystallites around the pencil of X-rays is proportional to the distribution of intensity around the 002 diffraction ring. Intensity measurements are made with a microdensitometer equipped with a rotating stage; the distribution of the crystallites is calculated from the intensity value, and the orientation is expressed by distribution curves which may be differentiated from one another by statistical methods. Typical data for three grades of cotton are presented to show the sensitiveness of the method.—A. P.-C.

Modern Ideas on the Structure of Cellulose. John H. Skinkle. Am. Dyestuff Reptr. 22: 267-268, 295-296 (1933).—A review of the evidence leading to the conception of the modern structural formula of cellulose.—A. P.-C.

Recent Work on the Structure of Compounds of High Molecular Weight and Its Significance in the Paper Industry. H. Mark. World's Paper Trade Rev. Tech. Conv. No. 12, 14, 16, 66-74 (March, 1933); Paper Maker & Brit. Paper Trade J. 85: TS85-91 (April, 1933).—An address briefly pointing out the present state of our knowledge concerning the structure of cellulose, showing how this state of knowledge has already been given practical application in the manufacture of rayon and briefly describing recent experiments showing that the study of surface phenomena are much more important than that of boiling, bleaching and beating from the standpoint of applying our knowledge of the structure of cellulose to the elucidation of paper making problems.—A. P.-C.

Chemical Investigaion of Bamboo. X. X-Ray Study of Bamboo Cellulose. Sutezo Oguri. Cellulose Ind. (Tokyo) 9: 59-67 (1933).—It is concluded from the investigation that bamboo cellulose has the same crystallographic properties as cotton cellulose.—A. P.-C.

The Action of Orthophosphoric Acid on Ordinary Cellulose. G. Champetier. Compt. Rend. Acad. Sci. 196: 930-933 (1933).—Cotton linters were treated with solutions of phosphoric acid containing 600 to 1300 g. per l. The increase in the amount of phosphoric acid taken up by the cellulose stopped at a concentration of 1050 g. per l. The fixation of the acid was complete in 15 hours. An addition compound containing no water of hydration and corresponding to the formula $3C_6H_{10}O_5.H_3PO_4$ was formed. The only change in the X-ray diagram of the cotton after treatment was a decreased intensity; washing the addition compound with water destroyed it and the cellulose was regenerated without having exhibited the phenomenon of mercerization.—A. P.-C.

Comparative Study of Jute and Cotton Cellulose. J. K. Chowdhury and N. N. Basu. J. Indian Chem. Chem. Soc. 9:615-631 (1932).—Purified cellulose from jute and from cotton give practically identical results from a chemical point of view, i.e., yield of cellulose acetate, glucose, cellulose actaacetate and methoxyl in methylated cellulose. There is a slight difference, however, in the behavior of the two celluloses when tested by means of alkalies of different concentrations with the subsequent formation of viscose. The difference is more prominent in the physical tests where the jute derivatives exhibit a higher surface tension, lower viscosity and greater solubility. Both jute and cotton celluloses consist of polyanhydroglucose residues, each glucose unit being probably linked to another in exactly the same manner, but the number of glucose residues constituting a polyanhydroglucose unit appears to be lower in the jute cellulose.—C. J. W.

Evolution of Heat in the Case of Adsorption of Caustic Soda by Cellulose and the Heat Effect of Mercerization. M. Tschilikin. Melliand Textfiber, 14, No. 8:404-406 (Aug., 1933).—The results of the author's experiments show that the amount of heat liberated by the adsorption of caustic soda by cellulose during mercerization depends upon the colloidal state of the fiber. The effect of various concentrations of sodium hydroxide in water and alcohol-water solutions, the causes of the differences in the quantities of heat given off when raw and treated cotton are mercerized and the effect of the moisture content of fibers are also discussed. According to the author, mercerization itself does not set free any heat.—C. J. W.

The Solid Lignosulphonic Acid and its Liberation. C. Kullgren. Svensk Pappers-Tidn. 36, No. 14: 499-501; No. 15: 542-534, 537-538 (July 31, Aug. 15, 1933).—This is a reply to Hägglund. Kullgren states that some of his findings and conclusions have been misrepresented and, in order to correct certain misunderstandings, he publishes a brief résumé of his theories concerning the liberation of the solid lignosulphonic acid during the sulphite cooking process.—C. J. W.

Raw Materials

Danube Grass for Paper Making. D. MacNeill Watson. World's Paper Trade Rev. 99: 1892, 1894, 1928-1934; 100: 146-152 (June 23, July 14, 1933); Paper Maker & Brit. Paper Tade J. 86: 56, 58, 60, 66, 67 (July, 1933).—A discussion showing that Danube grass fulfills the essential conditions for a commercially successful raw material for paper making, together with an outline of the experiments carried out in developing a satisfactory method of treatment.—A. P.-C.

Esparto Grass as a Paper Making Material. James Strachan. Paper Maker & Brit. Paper Trade J. 85: 348, 355-358 (April, 1933).—A discussion from the economic, technical and scientific points of view.—A. P.-C.

Laboratory Beating Characteristics of Unbleached Raffia Pulp. H. Ainsworth Harrison. World's Paper Trade Rev. 99: 1107-1108 (April 14, 1933).—When beaten to about 40 deg. Schopper-Riegler, unbleached raffia pulp increases in tearing strength by about 100 per cent.—A. P.-C.

The Characteristics of Esparto Cellulose. J. L. A. Macdonald. Paper Maker & Brit. Paper Trade J. 85: 343-348 (April, 1933).—A. P.-C.

Fibrous Raw Materials Committee Development Re-

port. John Traquair. Paper Trade J. 96, No. 26: 25-7 (June 29, 1933).—A brief discussion of developments during the past year relative to recovery of old papers and of the possibilities of using new pulpwoods and agricultural wastes, particularly straw.—A. P.-C.

Georgia Pines for Sulphite Pulp and News Print G. M. Rommel. Chem. Met. Eng. 40: 197-200 (1933).—Sulphite pulping experiments are reported on a slash, longleaf, loblolly, shortleaf and Virginia pines (mostly young growth and thinnings), under varying conditions of time, maximum temperature and ratio of free and combined sulphur dioxide in the cooking liquor. An acid of 5.5 per cent total and 1.0 to 1.4 per cent combined was found to be satisfactory, higher concentrations giving no particular advantage. An average cooking time of 10.5 hrs. was found ample, producing a yield of 43 to 45 per cent of screened pulp which developed good burst and tear values on beating. The color of the unbleached pulp from freshly cut wood, free from blue stain, was excellent.—A. P.-C.

Georgia Pine Sulphite and Groundwood for News Print. W. G. MacNaughton and W. F. Allen, Paper Trade J. 97, No. 2: 36-40 (July 13, 1933).—Difficulties encountered in pulping Georgia pine are apparently due solely to the high resin content of the heartwood. Experiments on sulphite pulping and grinding of small logs containing no heartwood gave results comparable to commercial pulping of spruce.—A. P.-C.

Investigation of Compression Wood of Spruce. I. Chemical composition of compression wood. E. Hägglund and S. Jjunggren. Svensk Kem. Tid. 55, No. 5:123-129 (May, 1933).—The authors have investigated the chemical composition of "compression" wood of spruce and compared it with that for normal spruce. The results may be summarized by stating that compression wood contains a higher lignin, gives off a smaller amount of acetic acid on treatment with lime, contains somewhat more hemicelluloses although smaller quantities of mannan and shows a smaller amount of pure cellulose than does ordinary spruce. The compression wood lignin differs from ordinary lignin in that it has a smaller percentage of methoxy but an increased amount of methylene oxide groups. The lignin sulphonic acids from the compression wood lignin do not precipitate with naphthylamine to the same extent as does the ordinary ligninsulphonic acid. —C. J. W.

Cellulose Content and Hydrolyzing Power of the Different Hemicelluloses of Spruce Wood. E. Hägglund and B. Proffe. Svensk Kem. Tid. 45, No. 5:117-123 (May, 1933).—The authors have cooked spruce chips both by the natural and acid sulphite processes and have determined the amounts of the various polysaccharides present in the bleached pulps and in the alpha-cellulose residue of the bleached pulps. They present evidence in support of the view that approximately half of the pentosans in the wood is easily hydrolyzed by the cooking liquor, while the other half is resistant to hydrolysis but is soluble in 17.5 per cent caustic and that a third to a half of the mannan behaves in a similar manner. They also suggest that a difficulty hydrolyzed glucan other than cellulose is present in relatively small amounts in bleached pulps—C. J. W.

Manufacture of Semi-Pulps from Waste of Coniferous and Deciduous Trees. O. Routala and J. D. Murto. Finnish Paper and Timber J. 15, No. 14:540, 542-543 (July 31, 1933).—Spruce and especially pine semi-pulps showed comparatively small tearing and bursting strength values, while experimental papers from hardwood pulps which are richer in pentosan and poorer in lignin yielded considerably larger strength values. A semi-pulp from alder, for instance, had a tearing length of 11,000 at 75 deg. Schopper-Riegler.—C. J. W.

Swedish Experiments Concerning the Quality of Pulpwood Used in the Sulphite Process. G. G. Klem. Papir-J. 21, No. 13:126-128; No. 15:144-148 (July 31, Aug. 29, 1933).—Klem reviews an article by G. Kinman on the quality of pulpwood used for the sulphite process. The factors which influence quality and cause variations, such as habitat, spring and summer wood, heat and sap wood, are discussed, the necessity for uniform pulpwood for cooking (within reasonable limits) is stressed and the relationship between wood quality and barking losses is illustrated. The fixing of the price of pulpwood on the basis of quality (pulp yield) is advocated.—C. J. W.

Turf Moss in Production of Paper. A. D. Solov'ev and N. I. Vasin. Bumazhnaya Prom. 12, No.6:56-61 (1933).—Experiments are described in producing several grades of paper from mixtures of bleached and crude turf moss in various proportions with waste paper and mechanical and chemical pulp. The results show technical and commercial feasibility of the process.—C. J. W.

Paper from Flax Chaff. N. N. Orlov and K. A. Dolgov. Bumazhnaya Prom. 12, No. 6: 35-45 (1933).—Tabulated results are given of physical properties of wrapping papers obtained by experimental cooking of flax chaff by various known methods.—C. J. W.

Value of Waste Paper as a Raw Material. E. von Pfaler. Finnish Paper and Timber J. 15, No. 15:562, 564-566, 567-569 (Aug. 15, 1933); Papier-Ztz. 58, No. 76: 1282 (Sept. 23, 1933).—This study deals with the repulping and regeneration of waste paper, according special attention to strength characteristics. In spite of the decreased tensile breaking, bursting and tearing strength of the regenerated fiber, it is technically possible to reuse waste paper with a large percentage of groundwood pulp. The profitableness of the process depends entirely upon local prices of paper and raw material. The composition of a number of de-inking baths is given, as are remarks concerning the efficiency of each and the nture of the de-inked product.—C. J. W.

De-Inking Solution. Frederick A. Brown. Brit. pat. 375,978 (July 7, 1932).—Printed paper stock is macerated in an aqueous solution containing sodium silicate and glycerin and the resulting pulp is washed. If the printed paper stock is impregnated with wax or oil, carbon tetrachloride is added to the aqueous solution. —A. P.-C.

De-Inking Waste Printed Papers. Industrial Products Corp. Fr. pat. 745,802 (Nov. 15, 1932).—The shredded paper is treated in a beater with an alkali metal salt of an amphoteric metal acid and of a fat which can form an acid soap.—A. P.-C.

Fiber Storage and Preservation. Treadway B. Monroe and Elbert C. Lathrop assignors to The Celotex Co. U. S. pat. 1,920,129 (July 25, 1933).—Densely baled, fermentable, fibrous, vegetable material, having an initial moisture content of 25 per cent or more, is piled so that with the interior bales the vertical sides of the bales contact adjacent bales at vertical corner edges only. The exterior bales are piled in relatively ordered arrangement, with spaces betwen them. Reservoirs containing a fungicide liquid are placed in contact with exterior bales, and the pile is covered to protect it from rain.—A. P.-C.

Mechanical Process

Observations on Groundwood. E. R. Durand, Paper Mill 56, No. 23: 29-30 (June 10, 1933).—A discussion of the production of higher quality groundwood at lower cost.—A. P.-C.

Groundwood Studies at the Forest Products Laboratories of Canada. H. Wyatt Johnston. Pulp Paper Can. 34: 555-559 (Sept., 1933).—Investigations by members of the stafi of the Pulp and Paper Division and research work carried out on groundwood manufacture since 1929 are summarized—A. P.-C.

Forest Products Laboratories of Canada Studies Affecting Groundwood Manufacture. W. Boyd Campbell. Pulp Paper Can. 34: 504-506 (Aug., 1933).—An address discussing work (other than investigations on grinding and groundwood) carried out during the past few years at the Pulp & Paper Div. of the Laboratories, which have influenced groundwood mill practice.—A. P.-C.

Mounting Artificial Pulp Stones. Thure Larsson assignor to Norton Co. U. S. pat. 1,920,204 (Aug. 1, 1933).—A single-piece centering hub is located by means of cement at the axis of the stone within a hole of large diameter. Readily accessible adjusting screws fixed to and projecting inwardly from the hub engage the shaft supporting the stone so as to adjust the centering of the stone on the shaft.—A. P.-C.

News Print from Boiled Wood. A. E. Parrett. Pulp Paper Can. 34: 515-516, 530, 532 (Aug., 1933).—A description of a Canadian mill's one-year experience with the Fish process of "boiling" and grinding wood.—A. P.-C.

Indicator. Alois Sumbs. U. S. pat. 1,915,456 (June 27, 1933).—The invention consists of an indicator for showing when the wood in a grinder pocket is approaching exhaustion.—A. P.-C.

Wood Grinder. Carl O. Bachman assignor to The Mead Research Engineering Co. U. S. pat. 1,917,420 (July 11, 1933).—The grinder is provided with two pockets which are situated on opposite sides of the stone, somewhat below the axis of the stones and slightly inclined upwards towards the stone so that the pressure in the pockets produces an upward component which helps support the weight of the stone. The pockets are set at an angle to the axis of the stone, so that the length of the logs is at an angle with the axis of the stone, the angle being adjustable according to operating conditions and the quality of pulp desired. Over each pocket is a wood magazine, separated therefrom by means of movable plate or grate bars. When a pocket has been emptied, the pressure foot is automatically retracted, the grate of plates drawn out to permit the pocket to refill itself from the magazine; the plates or bars are then returned to their position and pressure is applied to the charge in the pocket.—A. P.-C.

Sulphite Process

Kinetics of Sulphite Cooking Reactions. E. Stangeland. Kgl. Norske Videnskab. Selskabs Skrifter 1932, No. 1:1-103 (1933).—The Schmidt-Nielsen model autoclave process of cooking chips was modified to give absolutely reproducible results. Results obtained under various conditions of cooking showed that dissolving the incrusting material is a reaction of the first order; at constant temperature $k \times t = 2.303 \log a/(a - x)$, where a is the total incrusting material in the chips ÷ the quantity going into solution in the preliminary period, x incrusting material divided in time t and k is the reaction constant. It is the solution velocity of the sulphonated lignin compound, i.e., hydrolysis, which determines the total velocity of the process. This is doubled for each ten degrees of rise in temperature. Corresponding results were obtained with a two cubic meter autoclave. The sulphite process depends upon diffusion processes. Since the temperature coefficient of diffusion processes is 1.2 for a ten degree rise, whereas in this work a coefficient of two was found, it follows that it is mainly hydrolysis which determined reaction velocity, so that good circulation in the autoclave is essential. Small-scale cooks were made, in which rise in temperature corresponded to plant practice, and equations were deduced for calculation of solution of incrusting materials. In hydrolysis of lignin sulphonic acid, water and the hydrogen ion are the deciding factors. Presumably the hydrogen ion is not consumed in the hydrolysis, whereas water, which is consumed, is present in great excess, so that under normal cooking conditions both hydrogen ion and water concentrations are about constant. Since chips have a structure which allows water and the hydrogen ion to meet all the lignin/hydrocarbon molecules ,solution will be proportional to the quantity of incrusting material present. Micro tests can be used to great advantage in the study of commercial pulp processes.—C. J. W.

The Exchange of Cations in Strong Sulphite Pulp. C. Du Rietz. Svensk Kem. Tid. 45, No. 8: 185-195 (Aug., 1933).—This is a discussion of the surface activity of sulphite pulp. Cellulose can be classed as acidoid in nature. There are three types of adsorbed acid groups which determine this property: (1) strong highly ionized acids, such as $-SO_3H$; (2) weak acids of the carbonic acid type; (3) very weak acids such as phenol. Adsorption of ions on sulphite pulp, as determined by use of standard solutions and by ash content, is characteristic for each valence group. Likewise, the determination of pH of pulp by our present methods is subject to serious error if the water used for the bleaching contains appreciable amounts of dissolved salts. With these facts in mind the author claims that a modified acid number of Kullgren can be used to determine the degree of degradation of pulp.—C. J. W.

Study of the Factors Influencing the Chlorination of Mitscherlich Sulphite Pulp. Otto Kress and Edward H. Voigtman. Paper Trade J. 97, No. 7: 29-44 (Aug. 17, 1933).—A study of the effects of varying time, temperature, concentration and amount of chemical per unit weight of pulp, and also of isolated lignins as they relate to the chlorination of pulp.—A. P.-C.

Sulphite Pulping with Special Consideration of the Viscosity Properties of the Pulp. Hazime Okada, Eizi Hayakawa and Zenza Umeda. J. Soc. Chem. Ind. Japan 36: 219-220B (1933).—The viscosity of the pulp remains very high until the cooking liquor begins to darken, when the viscosity changes rapidly. Under definite cooking conditions the pulp viscosity is related to the color of the waste liquor. At each digestion temperature a relationship also exists between the viscosity and the acidity of the liquor, determined after elimination of free SO_2. Towards the end of digestion the rate of decrease of viscosity and of solution of lignin is influenced by cooking conditions, but the relation between viscosity and chlorine consumption is not markedly affected. Until viscosity has decreased considerably, copper number and alpha-cellulose content of the pulp are practically unchanged, but finally show rapid degradation. Solubility in hot 1 per cent caustic soda increases with decrease in viscosity.—A. P.-C.

Penetration During Sulphite Cooking. H. Saunderson, H. W. Johnston and O. Maass. Can. J. Research 8: 415-428 (1933).—The rate of penetration of sulphite

liquor through a block of spruce wood is constant for a fixed low temperature; at a constant high temperature the rate of penetration increases continuously during the duration of a run on account of the opening up of the wood. This "cooking" action becomes evident at about 90°C. for heartwood, and below 70°C. for sapwood. The rate of penetration of sulphite liquor is greater for a higher free SO_2 concentration, the increase becoming more noticeable at high temperatures, which is an indication that at least part of the effect is due to cooking action. The formation of a precipitate of calcium sulphite on the wood at high temperatures decreases the rate of forced penetration, which effect is more noticeable with porous wood where the pressure differential is small. The plugging action is largely a surface effect due to the formation of a layer of precipitate over the ends of the tracheids of the wood.—A. P.-C.

What's Ahead for the Sulphite Industry? P. A. Paulson. Paper Ind. 15: 247-248 (Aug., 1933).—A brief discussion of the probable lines of future development of the sulphite industry in the United States.—A. P.-C.

Variations in Yield and Quality of Sulphite Pulps Made of Spruce from Different Sources. Bjarne Johnsen and Charles H. Reese. Tappi Papers 16: 326-328 (June, 1933); Paper Trade J. 97, No. 1: 36-38 (July 6, 1933).—Results of tests on the evaluation of pulpwoods from different sources are reported and the technic used is described, and variations found are pointed out, to show that such investigations may be of value to individual mills in choosing sources of wood.—A. P.-C.

The Digestion of Wood. I. The Influence of Digesting Period Upon the Strength of Sulphite Pulp. Kazumoto Nakamura. Cellulose Ind. (Tokyo) 9: 93-97 (1933).—Cooking temperature raised rapidly above 100°C. at the beginning of digestion results in pulp with an inferior strength; when the temperature is kept lower in the later stage of cooking, the pulp increases in strength and is well bleached; the cooking time, however, is prolonged. Lowering the pressure at the end of the cook results in an easy-bleaching pulp, though a longer cooking time is required. The strength of the pulp is inversely proportional to the bleachability and decreases with beating. Maximum strength is attained on beating for 80 min. in the ball mill. —A. P.-C.

System of Wood Pulp Digester Control. Clayton D. De Mers assignor to Taylor Instrument Co. U. S. pat. 1,911,145 (May 23rd, 1933).—The two variables controlled are pressure and temperature, the former by the steam inlet valve, guided by a cam, the latter by the relief valve, guided by a second cam in conjunction with a thermometer bulb placed near the relief outlet.—A. P.-C.

Treatment Preliminary to Sulphite Cooking. Karl Y. Kylander. U. S. pat. 1,910,613 (May 23, 1933).—Wood chips are saturated with a liquid containing acetic acid, soda liquor, acetates or phosphates, and the material is then boiled, without previous washing, in sulphite liquor at a temperature materially above 130°C. and under a pressure above 4 to 6 atmospheres. The preliminary treatment serves to shorten the time of cooking required and reduce loss of material in the waste liquor.—A. P.-C.

Sulphite Pulping Process. Lemuel B. Decker. U. S. pat. 1,908,324 (May 9, 1933).—The relief liquor from a chip digester is conducted to a wood-block digester to subject the wood blocks to a preliminary cooking treatment during the operation of the chip digester prior to grinding the wood blocks. An apparatus is described.—A. P.-C.

Method of Utilizing Exhaust Gas Heat in the Manufacture of Sulphite Pulp and of Simultaneously Recovering Sulphurous Acid. Erik Oman assignor to Industrikemiska Aktiebolaget. U. S. pat. 1,908,615 (May 9, 1933).—The relief gas is passed through condensate to heat it up and drive off any sulphur dioxide it may contain, and the heat in the condensate is subsequently utilized; e.g., for evaporation of waste liquor. The gas is then passed through a condenser, which is also connected to the blow pit to recover the heat in the blow-pit gases and vapors. The cooling medium in the condenser is preferably waste liquor, which is thus heated to nearly 100°C. prior to evaporation. The uncondensed gases, consisting chiefly of sulphur dioxide, are then absorbed in water or in raw acid.—A. P.-C.

Sulphite Cooking Method. Leon V. Pelot and Frank Pelot assignors to Nekoosa-Edwards Paper Co. U. S. pat. 1,905,050 (April 25, 1933).—The gas relief line is provided with a valve controlled by any type of pressure regulator, which is in turn controlled by the pressure in the digester. The pressure regulator also automatically regulates the steam supply to the digester. The only manual operations are the opening and closing of the gas and liquor reliefs.—A. P.-C.

Cyclic Process for Sulphite Pulp Production. George A. Richter assignor to Brown Co. U. S. pat. 1,904,170 (April 18, 1933).—Wood chips are cooked in a sulphurous acid solution of alkali sulphite; the inorganic content of the spent cooking liquor is smelted in a reducing atmospheric to produce alkali sulphite and alkali carbonate, the smelted compounds are dissolved in water, the solution is carbonated to convert the alkali sulphite into carbonate, the carbonated solution is treated with a water-soluble oxidizing agent such as chlorine water to oxidize residual alkali sulphide to sulphite or sulphate, and the resulting solution is acidulated with sulphur dioxide to form a fresh liquor for repeating the cooking step of the cycle.—A. P.-C.

Sulphite Cooking Process. Ernst Hochberger assignor to The Canadian International Paper Co. Can. pats. 330,701, (March 7, 1933); 330,896 (March 14, 1933). —*No. 330,701*—Wood chips are cooked with a sulphite liquor in which substantially 50 per cent of the sulphur dioxide is in the combined form. The liquor is removed without substantially lowering the temperature or pressure. The material is washed with a preheated fluid, such as hot water, a preheated sulphurous acid solution or a portion of preheated cooking liquor, to remove impurities. The chips are cooked with water at 160° to 170°C. to liberate the fiber and hydrolyze the sulphonated liquor. *No. 330,896*—Wood chips are cooked short of fiber liberation with sodium bisulphite and the liquor is drained off without substantial lowering of temperature or pressure. A preheated solution of sulphurous acid is introduced and the chips are further cooked completely to liberate the fiber.—A. P.-C.

Wood Pulping Process. Thomas L. Dunbar assignor to Chemipulp Process, Inc. U. S. pat. 1,901,706 (March 14, 1933).—Material such as wood chips is soaked in heated bisulphite liquor under a pressure of about 50 lb. until the extractives are substantially removed and the liquor has penetrated the material; the liquor is drained off and mingled with fresh liquor for re-use; the fibrous material is digested under heat and pressure in bisulphite liquor until the lignin is substantially removed, bisulphite liquor is withdrawn, and mixed with fresh liquor for reuse and the fibrous material is cooked in an alkaline liquor until incrustants are substantially removed.—A. P.-C.

Pulping and Purifying Process. George A. Richter assignor to Brown Co. U. S. pat. 1,899,637 (Feb. 28, 1933).—The material is pulped in a non-acid sulphite cooking liquor and the resulting pulp is subjected to the action of an alkalining refining liquor of at least about 5

per cent alkalinity (calculated in terms of caustic soda equivalent), and the refined pulp is washed.—A. P.-C.

Dry Distillation of Residue of Sulphite Waste Liquor. Max Phillips. Ind. Eng. Chem. 25: 991-993 (Sept., 1933). —Dry distillation of the dry residue of sulphite waste liquor in a reduced atmosphere of carbon dioxide at a maximum temperature of 400°C. yielded: 22.3 per cent of aqueous distillate (containing acetic acid, acetone and methanol), 1.5 per cent of oily distillate containing acetic acid, guaiacol, 1-*N*-propyl-3-methoxy-4-hydroxybenzene, and a mixture of unidentified sulphur-containing compounds, 55 per cent of carbonized residue, and 21.2 per cent of gas (calculated by difference).—A. P.-C.

Reclaiming Sulphite Waste Liquor. Charles H. Reese assignor to Hammermill Paper Co. U. S. pat. 1,908,862 (May 16, 1933).—Lime is added to the liquor to neutralize the acid and a gelatinous material such as gelatin or glue is added to coagulate the precipitate; the liquor is heated to about 95°C. and is separated from the precipitate to obtain a clear liquor for subsequent use. —A. P.-C.

Use of Sulphite Waste Liquor for Producing Emulsions. Preston R. Smith, assignor to The Barber Asphalt Co. U. S. pat. 1,895,775 (Jan. 31, 1933).—A water-external-phase bituminous emulsion is produced by the addition of a salt of a metal of the third analytical group such as iron, aluminum or chromium sulphate to an approximately equal amount of concentrated sulphite waste liquor followed by the use of the resulting product as an emulsifying agent with bitumen.—A. P.-C.

Report of Experiments for Burning Sulphite Waste Liquor and Hog Feed. Svensk Pappers-Tidn. 36, No. 12: 432; 436, 439-440; No. 13: 466-470 (June 30, July 15, 1933).—The article describes in detail experiments which were carried out in a specially designed furnace type for burning sulphite waste liquor of only 40 per cent substance together with hog fuel. Combustion could be carried out on an experimental scale; the experiments showed however that continuous operation was not possible. The problem can be solved technically only when the liquor concentration is considerably raised before coming into contact with the hog fuel.—C. J. W.

Alkaline Processes

Producing Paper Pulp from Grasses, Etc., Without Heating. Harry E. Ellis. U. S. pat. 1,908,590 (May 9, 1933).—A pulp-producing apparatus is described which comprises a brine supply tank, an electrolytic device into which the brine tank discharges and which produces caustic soda and chlorine, a chemical tank, a pumping arrangement by which the caustic soda solution and chlorine may be alternately discharged into the chemical tank from the electrolytic device, and a discharge conduit for removing pulp from the chemical tank.—A. P.-C.

X-Ray Investigation of the Penetration of Electrolytes Into Wood. L. Thomassen and F. W. McCready. Paper Trade J. 97, No. 15: 42-43 (Oct. 12, 1933).—X-ray photographs of open granied spruce wood that had been submerged for a definite period in caustic soda solution showed that: (1) penetration is more rapid in summer wood than in spring wood; (2) penetration of caustic soda solutions is greater than that of water; (3) caustic soda penetration is more rapid at 132° than at 95°F.—A. P.-C.

Alkaline Process for Obtaining High Yields of Pulp From Aspen Wood. Roy L. Davis. Paper Trade J. 97, No. 8: 33-46 (Aug. 24, 1933).—Cooking aspen wood by means of a low percentage of soda at low concentration followed by a first-stage chlorination, an alkaline wash, and a final hypochlorite bleach, was found to give favorable results.—A. P.-C.

Dustless Rehandling of Salt Cake. E. P. Gleason. Paper Ind. 15: 319 (Sept., 1933).—A brief description of the system recently installed at the Port Edwards, Wis., plant of the Nekoosa-Edwards Paper Co.—A. P.-C.

The Destiny of Sulphate Pulp. R. H. Stevens. Paper Mill 56, No. 27: 5, 12 (July 8, 1933).—An outline of the tendencies of developments in the utilization of sulphate pulp.—A. P.-C.

Influence of Sulphidity On the Physical and Chemical Characteristics of Kraft Pulp. Otto Kress and George H. McGregor. Paper Trade J. 96, No. 24: 40-42 (June 15, 1933).—Two parts of caustic to one of sodium sulphide, plus or minus a normal variation in sulphidity occasioned by minor variations in the recovery operations, will produce an unbleached pulp of maximum yield of screenable stock of good strength and with screenings sufficiently softened so that they can be reduced by mechanical means.A. P.-C.

Influence of Chemical Concentration in Alkaline Pulping Processes. M. N. Bray and C. E. Curran. Paper Trade J. 97, No. 5: 30-35 (Aug. 3, 1933).—Increasing the concentration of chemicals in alkaline cooking liquor increases the rate of delignification of wood and of decomposition of cellulose and alpha-cellulose in the pulp. In kraft cooking, concentration has but little effect on strength or color; decreasing concentration increases the yield of screened pulp. In cooking bleachable kraft, low concentration of the cooking liquor conserves the strength and reduces bleach consumption.—A. P.-C.

Lime Halstuff. D. S. Sokolovskii. Bumazhnaya Prom. 12, No. 2-3: 27-31 (1933).—A good grade of wrapping paper was obtained from waste birch wood by cooking with 2-2, 5 deg. Be. calcium hydroxide for 6.5 hours at 150 deg. C. and 5 atmospheres pressure.—C. J. W.

Investigation of a Case of Corrosion in a Revolving Sulphate Digester. C. Benedicks and P. Sederholm. Svensk Pappers-Tidn. 36 No. 10: 362-366; No. 11: 402-403, 405-406 (May 31, June 15, 1933).—The strong corrosion which took place in three of four revolving digesters under investigation was found to be caused by the lack of the protective coating. Directions are given for obtaining a coating that will adhere well to the inner surface of the digester, such as avoiding sudden mechanical shocks and quick temperature changes, removing as fast as possible all gas which has been formed in the digester, cleaning the digester walls thoroughly after each cook from eventually adhering chips, roughening the digester surface before applying the coating, changing, if possible, the direction in which the digester revolves, admitting the steam always at the end and not in the center of the conical digester, etc. Several illustrations showing the corroding effects upon the metal are included in the article.—C. J. W.

Corrosion Phenomena in Sulphate Digesters. T. Samson. Svensk Pappers-Tidn. 36, No. 13: 470, 473 (July 15, 1933).—Samson shows how a correct liquor circulation arrangement will prevent local corrosion and improve general conditions.—C. J. W.

Salt Cake. B. Snellman. Finnish Paper and Timber J. 15, No. 16: 609-610, 612-614 (Aug. 31, 1933).—The main deposits of salt cake throughout the world are described, as well as the methods of production in the different countries.—C. J. W.

Purification of Pulp. Leon Delphanque. Fr. pats. 743,199 and 743,200 (March 25, 1933).—*No. 743,199*—

The hemi-celluloses are solubilized by treating at 85 deg. to 90 deg. C. with a solution containing caustic soda and sodium chloride; the product is then washed first with hot water containing 2 g. soda ash per liter, and then with cold water. *No. 743,200* provides an apparatus for carrying out the process continuously.—A. P.-C.

Modifying Cellulose. George A. Richter assignor to Brown Co. U. S. pat. 1,907,201 (May 2, 1933).—A mercerized and hydrolyzed cellulose fiber having an alpha-cellulose content of over 90 per cent and a solution viscosity of less than 0.5 is prepared by mercerizing in a caustic soda solution, washing the fiber free from most of the caustic soda, and digesting it at about 150 deg. C. with the residual caustic soda solution.—A. P.-C.

Improving Bleached Sulphite Pulp. Valentin Hottenroth and Otto Faust assignors to Zellstofffabrik Waldrof. U. S. pat. 1,904,235 (April 18, 1933).—Air-dried sulphite pulp 100 kg. is immersed in 12 per cent caustic soda solution 300 l. for 2 hours, pressed to reduce the weight to about 300 kg., separated into fibers and ripened for 5 days at 25 deg. C., washed, acidified and neutralized—A. P.-C.

Wood Pulping Process. Linn Bradley and Edward P. McKeefe assignors to Bradley-McKeefe Corp. U. S. pat. 1,898,612 and 1,898,613 (Feb. 21, 1933).—*No. 1,898,612*—Wood is cooked under pressure with a sodium sulphite cooking liquor containing an amount of sulphur dioxide or sulphite radical greater than that corresponding to sodium monosulphite and less than that corresponding to sodium bisulphite, the cooking liquor being alkaline to litmus when charged into the digester and proportioned to give a spent liquor alkaline to litmus. *No. 1,898,613*—Wood is cooked under pressure and at a temperature above 175 deg. C with a cooking liquor consisting essentially of caustic soda, sodium thiosulphate and sodium sulphite, in the respective proportions of at least 40 g., 10 g. and 15 g. per l., the total sodium content of the cooking liquor being at least 12 per cent of the bone-dry weight of the wood cooked.—A. P.-C.

Method of Rendering Soda or Sulphate Pulp Easy-Bleaching. Gothard Rosen. Fr. pat. 742,062.—The pulp is washed successively with very dilute alkaline solution, a hot alkaline-earth solution, chlorine water or soluble chlorides, then with acid and finally with water.—A. P.-C.

Highly Purified Alpha-Cellulose from Musa Fiber. Edward C. Worden, 1st, assignor to Hanson and Orth. U. S. pat. 1,899,223 (Feb. 28, 1933).—The mechanically disintegrated fiber is heated in an aqueous solution containing 3 to 10 per cent caustic soda and 0.5 to 8.0 per cent sodium silicate, together with a sulphonated oil, until the hemicellulosic and non-resistant cellulosic substances have been softened and are in condition for removal by washing; the mass is lixiviated until reaction products are removed and the purified material is decolorized with chlorine in the absence of air and washed until neutral.—A. P.-C.

Purifying Chemical Pulp. George A. Richter assignor to Brown Co. U. S. pat. 1,906,885 (May 2, 1933).—Cellulose pulp is treated in a mercerizing liquor, and the mercerized pulp is then bleached.—A. P.-C.

Treating Paper Pulp With Chlorine Gas. Hans John and Clarence C. LeFebvre assignors to Paper Patents Co. U. S. pat. 1,907,548 (May 9, 1933).—A relatively solid mass of thickened pulp is comminuted and passed downwardly through a treating tower (various details of which are described) in which it is contacted with chlorine to effect a substantial bleaching in a short time by repeated exposure of fresh surfaces of the pulp to contact with chlorine, and the material is then passed into a diluting bath before it has been injured by the chlorine.—A. P.-C.

Alkalizing Waste Liquors from Soda Pulp Manufacture Preparatory to Dry Distillation. Erik L. Rinman. U. S. pat. 1,906,102 (April 25, 1933).—The waste liquor is concentrated to about 50 per cent dry substance and alkalized while hot by adding and mixing barium oxide in pulverized condition to effect a reaction which generates sufficient heat to drive off most of the water.—A. P.-C.

Pulping and Liquor Recovery Process. Alfred M. Thomsen. U. S. pat. 1,902,106 (March 21, 1933).—Fiber is liberated from material such as waste wood or corn stalks by cooking with a liquor containing sodium sulphide, the fiber is separated from the spent cooking liquor, the latter is evaporated to a syrupy consistency, incinerated in a reducing atmosphere, the ashes are dissolved in water, soda ash formed during incineration is separated by fractional crystallization, and the resulting mother liquor is used for making up fresh cooking liquor.—A. P.-C.

Wood Pulping Process. Linn Bradley and Edward P. McKeefe assignors to Bradley-McKeefe Corp. U. S. pat. 1,906,836 (May 2, 1933).—Wood is cooked in a non-acid sodium sulphite liquor. Wood is also cooked in an alkaline cooking liquor comprising sodium sulphide. Sodium compounds are recovered from the residual liquor resulting from each cook and are used in preparing cooking liquor for the other digestion.—A. P.-C.

Control Over Lime Recovery Operations. M. B. Mount. Paper Trade J. 97, No. 14: 31-33 (Oct. 5, 1933).—A brief discussion of some of the troubles encountered in the operation of lime-recovery plants in pulp mills, explaining their causes and prevention.—A. P.-C.

Purifying Soda or Sulphate Black Liquor. Erik L. Rinman. Brit. pat. 361,697 (Oct. 13, 1932).—The liquor is freed from silica by adding to the cooking liquor, before or during digestion, one or more oxides or hydroxides of metals forming insoluble silicates, such as aluminum, calcium, zinc, or magnesium, the silica being precipitated as silicate on the cellulose fibers. Alternatively, aluminum hydroxide may be added in solution in caustic soda or as bauxite.—A. P.-C.

Recovery of Waste Liquor. Linn Bradley and Edward P. McKeefe assignors to Bradley-McKeefe Corp. U. S. pat. 1,909,929 (May 23, 1933).—Waste liquor from a sodium sulphite cook is subjected to a treatment including a furnacing step regulated to burn the combustible content of the liquor and to leave a product including inorganic sodium compounds; the product from the furnacing is passed in contact with other residual liquor from a similar pulping operation for the recovery of soluble compounds.—A. P.-C.

Recovery of Pulp Waste Liquors. Patentaktiebolaget Grondal-Ramen. Brit. pat. 376,654 (July 14, 1932).—Waste liquors from the sulphate or sulphite processes are dried, incinerated to remove organic matter, and the sulphides and thiosulphates are then removed. To a portion of the solution sulphur dioxide and calcium carbonate are added until all the alkali salts are transformed to bisulphites and to this is added a second portion of the solution in amount sufficient to precipitate all the calcium salts and to transform to bisulphites or sulphites the alkali salts of the second portion.—A. P.-C.

Furnace for Smelting the Residues from Evaporated Black Liquors. Hans N. Undén. U. S. pat. 1,910,724 (May 23, 1933).—The tuyeres comprise a double-walled tubular body, and cooling water is circulated in the space between the double walls. The lower end of the tuyere is provided with a double-walled, perforated, bulb-shaped enlargement, through which air is delivered in all directions.—A. P.-C.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING MARCH 3, 1934

CIGARETTE PAPER

Champagne Paper Corp., Waukegan, Havre, 151 cs.; Liggett & Myers Tobacco Co., by same, 334 cs.

WALL PAPER

F. J. Emmerich, Scythia, Liverpool, 3 bls.; F. J. Emmerich, Ausonia, London, 1 bale.

NEWSPRINT

Perkins Goodwin & Co., Hamburg, Hamburg, 325 rolls; Jay Madden Corp., Scanmail, Helsingfors, 1,071 rolls; The Star Co., Markland, Liverpool, N. S., 569 rolls; N. Y. Tribune, by same, 1,456 rolls; World Telegram, by same, 626 rolls; B. J. Warren, by same, 64 rolls.

PRINTING PAPER

E. Dietzgen & Co., Hamburg, Hamburg, 9 cs.; Oxford University Press., Scythia, Liverpool, 5 cs.; H. Reeve Angel & Co., Inc., Ausonia, London, 1 cs.

WRAPPING PAPER

Borden Riley Paper Co., Hamburg, Hamburg, 18 cs.; Steiner Paper Corp., Boschdyk, Rotterdam, 80 bls.

FILTER PAPER

H. Reeve Angel & Co., Inc., Ausonia, London, 2 cs.

FILTER COMPOUND

Gerhard & Hey, Boschdyk, Rotterdam, 25 pkgs.

FILTER MATERIAL

——, Boschdyk, Rotterdam, 50 bls.

METAL COATED PAPER

K. Pauli Co., Hamburg, Hamburg, 33 cs.

SURFACE COATED PAPER

Globe Shipping Co., Hamburg, Hamburg, 29 cs.

IVORY BOARD

R. F. Downing & Co., Boschdyk, Rotterdam, 14 cs.

PHOTO PAPER

J. J. Gavin, Olympic, Southampton, 5 cs.; A. H. Niemeyer, Ausonia, London, 1 cs.

TRANSFER PAPER

Rohner Gehrig & Co., Bremen, Bremen, 16 cs.

DECALCOMANIAS

Phoenix Shipping Co., Hamburg, Hamburg, 3 cs.; Sellers Transportation Co., by same, 5 cs.; Sellers Transportation Co., Bremen, Bremen, 16 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Scythia, Liverpool, 11 cs. (duplex).

TISSUE PAPER

B. F. Drakenfeld & Co., Scythia, Liverpool, 4 cs.; F. C. Strype, by same, 1 cs.; Van Oppen & Co., Pr. Polk, Marseilles, 5 cs.; W. J. Byrnes, Ausonia, London, 1 cs.

COLORED PAPER

Borden Riley Paper Co., Black Tern, Antwerp, 2 cs.

PASTE BOARD

Coty, Inc., Champlain, Havre, 42 cs.

MISCELLANEOUS PAPER

Standard Products Corp., Champlain, Havre, 7 cs.; J. W. Masters & Co., by same, 33 cs.; ——, Hamburg, Hamburg, 7 cs.

RAGS, BAGGINGS, ETC.

Johns Manville Corp., Hamburg, Hamburg, 76 bls. rags; E. J. Keller Co., Inc., Black Tern, ——, 201 bls. flax waste; E. J. Keller Co., Inc., by same, 115 bls. bagging; Darmstadt Scott & Courtney, Black Tern, Atnwerp, 355 bls. jute waste; Castle & Overton, Inc., by same, 98 bls. jute waste; W. Steck & Co., by same, 104 bls. jute waste; Leigh Textile Co., by same, 78 bls. cotton waste; ——, Pr. Polk, Marseilles, 55 bls. rags; ——, Boschdyk, Rotterdam, 72 bls. rags; Leigh Textile Co., by same, 271 bls. cotton waste; J. J. Ryan & Sons, by same, 404 bls. cotton waste; E. J. Keller Co., Inc., Southern Cross, ——, 35 bls. rags; Irving Trust Co., Chr. Sass, Barcelona, 153 bls. rags; ——, by same, 122 bls. rags; F. Stern, by same, 74 bls. rags; Bank of N. Y. Trust Co., Chr. Sass, Valencia, 42 bls. rags.

BONE GLUE

——, Hamburg, Hamburg, 25 bags.

CASEIN

Bank of N. Y. Trust Co., Southern Cross, B. Ayres, 333 bags.

OLD ROPE

——, Capulin, Leith, 100 coils; Irving Trust Co., Bilderdyk, Rotterdam, 75 coils; ——, Chr. Sass, Barcelona, 51 bls.

WOOD PULP

Lagerloef Trading Co., Scanmail, Helsingfors, 1564 bls. sulphite, 279 tons; Castle & Overton, Inc., by same, 3602 bls. sulphite, 719 tons; The Borregaard Co., Inc., United States, Oslo, 336 bls. wood pulp, 56 tons; Castle & Overton, Inc., Bilderdyk, Rotterdam, 836 bls. wood pulp; ——, Karpfanger, Hernosand, 2700 bls. sulphate, 450 tons; Mead Sales Co., Karpfanger, Sundsvall, 500 bls. chemical pulp, 101 tons; Bulkley Dunton & Co., Karpfanger, ——, 1500 bls. sulphite, 304 tons; E. J. Keller Co., Inc., New York, ——, 328 bls. wood pulp, 50 tons.

WOOD PULP BOARDS

Lagerloef Trading Co., Scanmail, Helsingfors, 333 bls.

BOSTON IMPORTS

WEEK ENDING MARCH 3, 1934

International Purchasing Co., Capulin, Hull, 60 coils old rope; M. M. Taskins, Capulin, London, 32 bls. rags; W. Steck & Co., Black Tern, Antwerp, 118 bls. jute waste; Meredith Linen Mills, by same, 78 bls. flax waste; Irving Trust Co., by same, 77 coils old rope; Forte Dupee Sawyer, by same, 93 bls. rags; ——, Scythia, Liverpool, 73 bls. rags; ——, by same, 165 bags hide cuttings; G. F. Malcolm Co., Inc., by same, 10 cs. tissue paper; C. H. Powell

& Co., Bilderdyk, Rotterdam, 315 rolls straw boards; C. H. Powell & Co., by same, 70 pkgs. straw boards; ——, Karpfanger, Hernosand, 2400 bls. sulphite, 400 tons; Perkins Goodwin & Co., Karpfanger, Sundsvall, 11,600 bls. sulphate, 1930 tons; Perkins Goodwin & Co., by same, 1500 bls. sulphite, 304 tons; Bulkley Dunton & Co., Karpfanger, ——, 4950 bls. wood pulp, 914 tons; Parsons & Whittemore, Inc., Westerwald, ——, 250 bls. sulphite.

PORTLAND IMPORTS

WEEK ENDING MARCH 3, 1934

——, Karpfanger, Sandarne, 2500 bls. sulphate, 500 tons; Johaneson Wales & Sparre, Inc., Karpfanger, Sundsvall, 6750 bls. sulphite, 1143 tons; Bulkley Dunton & Co., Karpfanger, ——, 7125 bls. chemical pulp, 1447 tons; J. Andersen & Co., Karpfanger, Sundsvall, 3000 bls. sulphate, 508 tons.

PHILADELPHIA IMPORTS

WEEK ENDING MARCH 3, 1934

Phila. National Bank, Capulin, London, 152 bls. waste paper; E. J. Keller Co., Inc., Black Tern, ——, 615 bls. rags; E. J. Keller Co., Inc., Bilderdyk, ——, 106 bls. rags; Castle & Overton, Inc., Bilderdyk, Rotterdam, 300 bls. wood pulp; Gilman Paper Co., Markland, Liverpool, N. S., 2021 rolls newsprint; E. J. Keller Co., Inc., City of Flint, ——, 336 bls. wood pulp; Gottesman & Co., Inc., Argosy, Sweden, 1000 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING MARCH 10, 1934

Congoleum Nairn Co., Waukegan, Havre, 220 bls. rags; Congoleum Nairn Co., Waukegan, Dunkirk, 303 bls. rags; Castle & Overton, Inc., Bilderdyk, Rotterdam, 980 bls. wood pulp; ——, Bilderdyk, Rotterdam, 42 coils old rope; N. Y. Trust Co., by same, 1038 bls. wood pulp; Parsons & Whittemore, Inc., City of Baltimore, ——, 125 bls. sulphite; Gottesman & Co., Inc., Argosy, Sweden, 2750 bls. wood pulp; Gottesman & Co., Inc., Faxen, Sweden, 1000 bls. wood pulp; Gottesman & Co., Inc., Titania, Norway, 3555 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING MARCH 10, 1934

R. J. Reynolds Tobacco Co., Bilderdyk, Rotterdam, 930 cs. cigarette paper; Chase National Bank, by same, 274 bls. bagging.

PAPER INDUSTRY UNDER NRA

(*Continued from page* 13)

try and second, it stops the inevitable trend of constantly lower prices which have meant in the past and will mean again lower wages, no profits and eventual bankruptcy.

Fourth, the small producer should expect no special benefit either by the inclusion or the failure to include an open price plan in a particular industry.

Almost without exception, all manufacturers concerned were small once and the small concern with a fair basis of competition must expect to march forward with the bigger producer.

In closing, I want to urge one word of caution. Business men throughout the nation for many months have been struggling to accomplish the purposes of the National Recovery Administration and it would be unusual if they did not at times become impatient. We are in effect passing through a revolution. That word often makes us think of bombs, machine guns, and bloodshed, but this revolution which contemplates a complete change in the individualistic attitude of industry and a recognition of the fact that every one must give something for the common good has been and will continue to be a peaceful and orderly one. Time, therefore, is needed to work out all of the problems. The NRA has done wonders in the months since it was organized. Labor has cooperated magnificently in all branches of industry and particularly in the paper industry.

The NRA cannot do everything on a moment's notice. Let each of us, therefore, be patient and diligent in the work before us. I take the liberty of making one suggestion to the NRA and that is, to the limit of its ability, speed up action to bring into line that recalcitrant 10 per cent which can ruin the whole program.

The notorious violators of codes and those addicted to unfair dealing must speedily come to realize that they cannot be permitted to wreck the whole recovery idea.

Paper Industry Well Represented

All branches of the paper industry were well represented here at the big NRA code authority meetings in session this week.

Among the paper representatives registered are included: S. L. Willson, chairman paper industry code authority; George H. Mead, F. J. Sensenbrenner, H. R. Baldwin, D. C. Everest, J. L. Riegel, J. P. Hummel, C. H. Burrows; J. D. Byrne, R. S. Kellogg, A. L. Hobson, Carl E. Whitney, Captain Cola G. Parker, Charles W. Boyce, A. R. Graustein, J. W. Kieckhefer, and others. It is expected that they will participate actively in several of the code sectional meetings.

Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

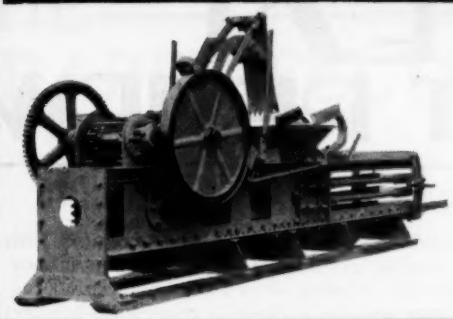
BOSTON, Mass., March 5, 1934—At a meeting of the New England, Central and Northern New York Regional Committee (Region No. 1) designated by the Code Authority for the Paper Distributing Trade, held Friday, March 2, plans were perfected for putting into effect price reporting plans for this region. The committee is composed of the following: Charles A. Esty, member Code Authority, chairman Region No. 1, Carter, Rice & Co. Corp., Boston; Matthew O. Byrne, vice-chairman, Whitney Bros., Boston; Harold R. Robinson, C. H. Robinson Company, Portland, Me.; Leroy M. Gardner, R. L. Greene Company, Providence, R. I.; Sterling Chatfield, Minotte E. Chatfield Company, New Haven, Conn.; William N. Stetson, Jr., Storrs & Bement Company, Boston; Edgar L. Potter, Potter-Taylor Corporation, Albany, N. Y.; Roger Wellington, Alling & Cory Company, Rochester, N. Y.; Oliver Bauman, R. H. Thompson Company, Buffalo, N. Y.; Leslie Rogers, Bowes Bros., Utica, N. Y., and Frank B. Cummings, executive secretary, 49 Federal Street, Boston. All members of the committee were present at the meeting except Mr. Rogers.

Jerry Whale, of Menasha, Wis., a member of the sales force of the Gilbert Paper Company of that place, of which the Andrews Paper Company is a New England distributor, passed a week here with the sales staff of the Andrews Company, making many new contacts, and had a very successful trip.

W. F. Mann, of the sales staff of Baird & Bartlett Company, box board dealers, sailed Wednesday on a trip to Mexico and Cuba, planning to pass a week in Mexico City.

Allis-Chalmers Move Buffalo Office

The Allis-Chalmers Manufacturing Company announces the removal of its Buffalo district office on February 24, 1934 to the Liberty Bank Building. A. D. Brown is the district manager in charge.



ANYTHING SQUEEZABLE
can be turned into MONEY
QUICKER — CHEAPER

with the Famous Ohio Baling Press of the proper size. You can turn your waste and scrap into profitable bales. Made in four sizes producing paper bales weighing from one hundred to one thousand pounds. Write today for catalog and information.

THE OHIO CULTIVATOR CO., Bellevue, Ohio

RELIABLE

PMC paper-making chemicals measure up to the job. They are of high quality, and their use is backed by reliable service.

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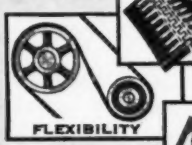
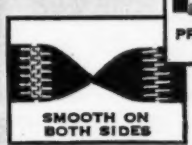
SUPERIOR CHEMICALS
ROSIN SIZE • SATIN WHITE
INDUSTRIAL CHEMICALS
PAPER MAKERS CHEMICAL CORPORATION
KALAMAZOO, MICHIGAN
PLANTS IN ALL LARGE PAPER-MAKING AREAS
Distributor of Hercules Wood Rosins and Steam-distilled Pine Oils

"Never Lets Go"
ALLIGATOR
TRADE MARK REG. U.S. PAT. OFFICE
STEEL BELT LACING





For belts of all kinds and sizes. "The most universally used belt lacing on earth." Holds belt ends in vise-like compression grip. Separable. Joint usually lasts as long as the belt. Rocker hinge pin protects lacing against internal wear. Reliable for use wherever a belt will give efficient service. In 11 sizes for belts from tape up to 5/8 inch thick. Made also in MONEL Metal.

Sold the World Over

Sole Manufacturers
FLEXIBLE STEEL LACING CO.
4689 Lexington Street Chicago, Illinois
In England at 135 Finsbury Pavement, London, E.C.2

Accept No Substitutes

TRIMBEY MACHINE WORKS
GLENS FALLS, N. Y.
Manufacturers of
WEIGHT REGULATORS
CONSISTENCY REGULATORS
PROPORTIONING AND METERING SYSTEMS
PULP SCREENS—FLOAT VALVES

PAPER MAKERS IMPORTING CO. INC. EASTON, PENNSYLVANIA U.S.A.

FINEST PAPER CLAYS

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, March 7, 1934

Sentiment in the local paper market continues optimistic. Demand for the various grades of paper is presistent, in some instances, and moderately active in others. Sales forces of the leading paper organizations express confidence in the future. Prices are well maintained and reports of shading are infrequent.

The position of the newsprint paper market is practically unchanged. Production in the United States and Canada is being maintained in sufficient volume to take care of current requirements. Consumption is running ahead of the volume transacted in the corresponding period of the preceding year. Prices are more stable than for some time past.

Steadiness prevails in the paper board market. Demand for box board is fairly heavy for the time of year. Quotations on the various grades of paper board are steady. The fine paper market is exhibiting a strong undertone. Tissues are moving in good volume. The coarse paper market is sharing the general improvement.

Mechanical Pulp

The ground wood pulp market is decidedly firmer. With offerings both in North America and abroad limited, prices are generally higher. No. 1 imported moist mechanical pulp is now quoted at from $27 to $29 per ton and dry at from $27 to $30 per ton, on dock, Atlantic ports. No. 1 domestic and Canadian ground wood pulp is selling at from $24 to $29 per ton, f.o.b. mill.

Twine

The local twine market continues moderately active. Demand for the various grades is considered satisfactory for the time of year. With the approach of the Eastertide holidays trading should become more lively. Despite the usual keen competition for desirable orders, quotations remain stteady and unchanged.

Chemical Pulp

Conditions in the chemical pulp market are fairly satisfactory. The bright particular feature of the week has been the increased demand for domestic and imported kraft pulp. Other grades of chemical pulp continue steady. Prices are generally holding to previously quoted levels, without difficulty.

Old Rope and Bagging

The old rope market is practically marking time. Paper mill demand for both domestic and imported old manila rope is resricted at present. Small mixed rope is moving in moderate volume. Old rope prices remain unchanged. The bagging market is more buoyant. Scarp and gunny bagging are in better request. Roofing bagging is firmer.

Rags

Some improvement transpired in the domestic rag market. Demand for new cotton rags is fairly persistent for the season. No. 1 white shirt cuttings continue firm. Offerings of roofing grades are scarcer and quotations higher. More interest is being shown in the imported rag market than of late and the outlook is considered brighter.

Waste Paper

Trading in the paper stock market is brisk. Quotations on the higher grades of waste paper have advanced, especially on white envelope cuttings, hard and soft white shavings, and book stock. Manilas and old kraft machine compressed bales are also higher. Board mill demand for the lower grades is fairly active and prices are steady.

Boston Paper Market Fairly Active

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., March 5, 1934—The paper market here averaged fair during the last week. In certain quarters business was good in fine papers throughout the week, showing much improvement. With some others the latter part was rather lively, with many indications of a larger volume of sales to come. The activity which generally prevailed during the first three-quarters of February, disrupted by the storm, is resuming. The trend is towards the buying of a little higher class of paper for advertising purposes. Wrapping paper was rather quiet, but there are indications that March will be a fairly good month.

Owing to bad weather, truck ing has been done with difficulty, so that collections of paper stock have been curtailed. This condition has a tendency to raise prices on waste paper and low-grade rags and, taken as a whole, the market is said to have increased about ten per cent. There was an active market in old papers, with some big sales in corrugated boxes, on which the market is rather well exhausted. This grade is quoted at .45 up to .50 and .55. Bagging moved well at sustained prices, with foreign gunny selling on the dock and f.o.b. Boston at 1.50. Jute rope is quoted at 1.35 and scrap burlap at 1.15. Roofing rags were active. The market was active on roofing rags.

Waste Material Dealers to Hold Banquet

Reservation blanks have recently been sent out by the National Association of Waste Material Dealers, Inc., covering its twenty-first annual banquet. The affair will close the association's three-day Convention to be held at the Hotel Astor, New York, March 19, 20 and 21. The annual banquet is scheduled for the evening of March 21 and reservations received well in advance of the sending out of the notices indicate a record-breaking attendance.

As each of the divisional associations of the organization have been re-organized as practically separate associations, each with its own executive committee, there are now approximately 75 officers, directors and members of the various executive committees, all of whom are arranging to attend the convention. This will insure very substantial support for the annual banquet.

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

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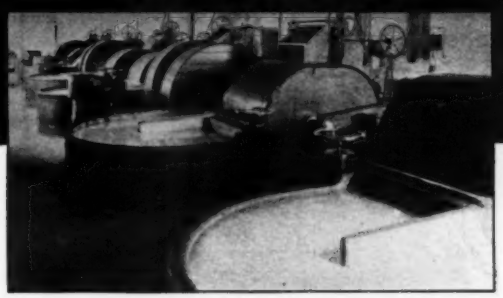
CANTON, MASS.

Woolen manufacturers since 1856

AMERICA'S PREFERRED TUBING *for* *Pulp and Paper Manufacture*



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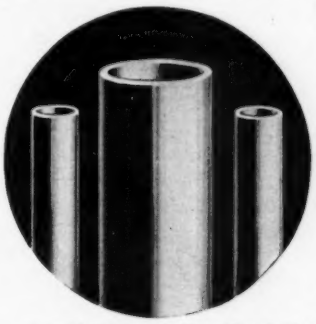
NATIONAL U S S 18-8 Stainless and Heat Resisting Pipe and Tubes are especially recommended for digester relief lines, heater coils, pulp stock lines, bleaching tank piping, and similar services where corrosion of equipment or discoloration of product leads to excessive operating or maintenance costs. They are highly resistant to corrosion by sulphate and sulphate pulping liquors, bleaches and similar paper-making chemicals; they are exceptionally ductile and have twice the strength of ordinary steel. Being seamless, NATIONAL U S S 18-8 Stainless and Heat Resisting Pipe and Tubes have no welds—no uncertainty about full wall-strength. Easily machined, bent, welded, or otherwise fabricated. Available in a wide range of diameters, wall-thicknesses, lengths, and shapes. NATIONAL engineers and metallurgists will gladly aid in determining the most effective application of this material to specific needs.



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NATIONAL TUBE COMPANY

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PITTSBURGH, PA.

NATIONAL USS STAINLESS AND HEAT RESISTING PIPE AND TUBES

A FOAM KILLER with 7 outstanding features

Here are the advantages which make Nopco Foam Killer No. 1333 the choice of so many leading paper plants:

1. **It is highly concentrated, so the defoaming solution can be made up at even lower cost than kerosene.**
2. **Its chemical construction is entirely different from other compounds (some of which are adulterated with as high as 70% moisture).**
3. **It has no ill effect whatever upon the size, causes no weakness, and will not break down.**
4. **It will not cause discoloration or grease marks.**
5. **It is entirely soluble in water.**
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7. **It is non-inflammable.**

Nopco Foam Killer No. 1333 is a scientifically blended compound, for use on practically all grades of paper made from any kind of stock. Write for detailed data.

NATIONAL OIL PRODUCTS CO.

Harrison, N. J.

NOPCO

Boston Chicago Portland Seattle San Francisco

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, March 7, 1934.

BLANC FIXE.—Conditions in the blanc fixe market are fairly satisfactory. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The position of the blanc fixe market is practically unchanged. Contract shipments are moving in good volume. Prices are maintained at formerly quoted levels. Bleaching powder is quoted at from $1.90 to $2.15 per 100 pounds, in drums, at works.

CASEIN.—The casein market is fairly active. Domestic standard ground is quoted at 12 cents and finely ground at 13 cents per pound. Argentine standard ground is selling at 15½ cents and finely ground at 16 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is persistent. Prices are holding to schedule without difficulty. Solid caustic soda is quoted at from $2.60 to $3.10; while the flake and ground are selling at from $3 to $3.05 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is exhibiting a strong undertone. Prices continue steady to firm. Imported china clay is quoted at from $13.50 to $21 per ton, ship side; while domestic paper making clay is selling at from $5 to $12 per ton, at works.

CHLORINE.—Paper mill demand for chlorine is fairly heavy. The contract movement is well up to average. Prices continue steady to firm. Chlorine is quoted at from $2 to $2.25 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is slightly easier. Grades of gum rosin used in the paper mills are now quoted at from $6.25 to $6.45 per 280 pounds, in barrels, at works; while wood rosin is selling at $5.10 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—The salt cake market is firm. The contract movement is normal. Salt cake is still quoted at from $12 to $14, and chrome salt cake at from $12 to $12.50 per ton, at works; while imported salt cake is selling at from $12 to $12.50 per ton, on dock.

SODA ASH.—Trading in the soda ash market is brisk. Shipments against contract are moving regularly. Prices are steady. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.10; in bags, $1.40; and in barrels, $1.50.

STARCH.—The starch market is rather quiet. Contract shipments are going forward at a seasonal pace. Prices are holding to schedule. Special paper making starch is quoted at $2.67 per 100 pounds, in bags; and at $2.95 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Demand for sulphate of alumina is well sustained. Prices are holding to schedule. Commercial grades are quoted at from $1.35 to $1.50; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and nearby car loads, the quotation is $21 per ton.

TALC.—Business in the talc market is fairly buoyant. Prices are generally holding to formerly quoted levels. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	—
Bonds	6.00	@	—
Index	6.00	@	—
Writings—			
Extra Superfine	6.50	@	—
Superfine	6.25	@	—
Tub sized	5.75	@	—
Engine sized	5.50	@	—
Book, Cased—			
S. & S. C.	5.35	@	5.75
S. & S. C. Litho.	5.60	@	6.00
M. F.	5.10	@	5.50
Coated and Enamel	5.90	@	6.55
Coated Litho	5.90	@	6.55
Tissues—Per Ream—			
White No. 1	.60	@	.80
White No. 2	.55	@	.70
Anti-Tarnish M. G. only	.75	@	.80
Colored	.80	@	1.00
Kraft	.75	@	.80
Manila	.65	@	.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.11	@	—
No. 2	.10	@	—
Bleached, basis 20 lbs.	.13	@	—

(Delivered New York)

News, per ton—			
Roll, contract	40.00	@	—
Rolls, spot	40.00	@	—
Sheets	45.00	@	—
Side Runs	25.00	@	—
Kraft—			
No. 1 Domestic	4.75	@	5.00
No. 2 Domestic	3.87½	@	—
Southern	3.87½	@	—
Boards—per ton—			
News	45.00	@	50.00
Chip	42.50	@	47.50
Sgl. Mla. Ll. Chip	52.50	@	55.00
Jute Lined Chip	52.50	@	55.00
White Patent Coated	60.00	@	65.00
Binders Boards	68.00	@	72.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	27.00	@	29.00
Dry	27.00	@	30.00

(F.o.b. Mill)

No. 1 Domestic and Canadian	24.00	@	29.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Division 1	2.85	@	—*
Division 2	2.80	@	—*
Division 3	2.75	@	—*
Prime Qualities—			
Class 1. All Prime Easy Bleaching	2.25	@	—*
Other Than Easy Bleaching—			
Class 2. Higher Than Standard	2.20	@	—*
Class 3. Standard	2.15	@	—*
Class 4. Lower than Standard	2.10	@	—

(On Dock, Atlantic Ports)

Kraft No. 1	1.75	@	1.90
Kraft No. 2	1.60	@	1.70

(F.o.b. Pulp Mill)

Kraft Domestic (Delivered)	1.60	@	2.75
Soda Bleached	2.50	@	—

* Add 5 Cents for Albany and 15 Cents for Lake Ports.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.00
Silesias No. 1	4.25	@	4.50
New Unbleached	6.75	@	7.25
New Soft Blacks	3.00	@	3.25
Blue Overall	4.00	@	4.25
Fancy	2.50	@	2.75
Washables	1.75	@	2.00
Mixed Khaki Cuttings	3.00	@	3.25
O. D. Khaki Cuttings	3.75	@	4.00
Men's Corduroy	1.50	@	1.75
New Mixed Blacks	2.50	@	2.75

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	@	3.25
White, No. 2—			
Repacked	1.75	@	2.25
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.25	@	1.50
Black Stockings	2.50	@	3.00
Roofing Rags—			
No. 1	1.15	@	1.30
No. 2	.85	@	.90
No. 3	.75	@	.80
No. 4	.70	@	.75
No. 5A	.65	@	.70

Foreign Rags

New Rags

New Dark Cuttings	1.60	@	1.70
New Mixed Cuttings	1.75	@	1.85
New Light Silesias	3.75	@	4.00
Light Flannelettes	3.75	@	4.00
Unbleached Cuttings	6.50	@	6.75
New White Cuttings	6.50	@	6.75
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	3.75	@	4.00
No. 2 White Cotton	3.00	@	3.25
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	1.75	@	1.85
French Blue Linens	2.30	@	2.40
German Blue Linens	2.15	@	2.25
German Blue Cottons	1.70	@	1.80
Checks and Blues	1.30	@	1.40
Linsey Garments	1.50	@	1.75
Dark Cottons	1.15	@	1.30
Old Shopperies	1.00	@	1.10
New Shopperies	.90	@	1.00
French Blues	1.70	@	1.80

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

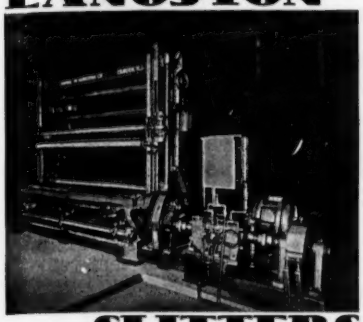
Gunny No. 1—			
Foreign	1.50	@	1.60
Domestic	1.40	@	1.50
Wool Tares, light	1.20	@	1.30
Wool Tares, heavy	1.25	@	1.35
Bright Bagging	1.20	@	1.30
Manila Rope—			
Foreign	2.40	@	2.50
Domestic	2.50	@	2.75
Small Mixed Rope	1.10	@	1.35
New Burlap Cut	2.00	@	2.25
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.65	@	2.75
Ordinary Hard White No. 1	2.35	@	2.45
Hard White No. 2	2.10	@	2.20
Soft White No. 1	2.00	@	2.10
Flat Stock—			
Stitchless	.95	@	1.05
Over issue Mag	.95	@	1.05
Solid Flat Book	.85	@	.95
Crumpled No. 1	.65	@	.75
Solid Book Ledger	1.50	@	1.65
Ledger Stock	1.05	@	1.15
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.65	@	1.75
New Cuttings	1.20	@	1.30
Print	Nominal		
Bogus Wrapper	.40	@	.50
Container	Nominal		
Old Kraft Machine—			
Compressed bales	1.25	@	1.35
News—			
No. 1 White News	1.25	@	1.30
Strictly Overissue	.70	@	.75
Strictly Folded	.50	@	.55
No. 1 Mixed Paper	.35	@	.40

LANGSTON



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The heavy-duty Langston Slitter can be had in any width, to wind any diameter. Use it as a winder or as a rewinder. Speed up to 3000 feet per minute. Makes rolls of uniform density, square-edged. Langston's Shear-Cut makes no dust—the paper is *clean-cut*, not ground apart. A catalog is yours for the asking.

SAMUEL M. LANGSTON CO., Camden, N. J.

EMERSON BEATERS

THE EMERSON MANUFACTURING CO.
LAWRENCE—MASSACHUSETTS
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CLINTON STARCHES

Special Grades for Beater and Top Sizing

Manufactured by
CLINTON COMPANY
CLINTON, IOWA

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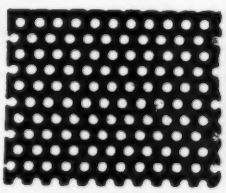
Perforated Metal Screens
For Pulp and Paper Mills

STEEL, COPPER, BRASS, BRONZE, MONEL METAL and other Alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.



".065" Round

CHARLES MUNDT & SONS
63-65 FAIRMONT AVE. JERSEY CITY, N. J.

PERMANENT COLORS

Browns Greens Reds Yellows

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Oxides of Iron
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GREENS
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REDS
All types and shades of Oxides of Iron

YELLOWS
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Asbestines and Talcs for Fillers

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Uniform Quality Dependable Service

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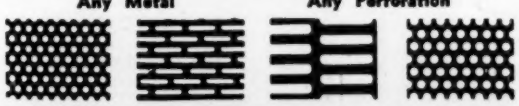
Oldest and Largest Producers of Casein in America

Pulp and Paper Mill Screens
Of Stainless Steel—Copper—Bronze—Monel—Chemical Resisting Alloys
Perforations that are accurate in size
Any Metal Any Perforation



The Harrington & King PERFORATING CO.
5652 FILLMORE ST., CHICAGO, ILL. 114 LIBERTY ST., NEW YORK, N.Y.

GLAZED TILE TANKS

Cost less and much more durable than concrete or cypress. Cleaner. Will not "slime up." Over 300 now in use in mills from Maine to Minnesota.

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TANK and SILO COMPANY
Kalamazoo Michigan

We've been building wood stock chests, acid tanks and blow pits for over 60 years.

Twines
(F. o. b. Mill)

Cotton—			
B. C. 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.15½	@	.16½
No. 2	.15	@	.16
Tube Rope—			
4-ply and larger	.09¼	@	.09¾
Fine Tube Rope—			
4-ply	.11¼	@	.11¾
3-ply	.14¼	@	.14¾
2-ply	.14¼	@	.14¾
Paper Makers Twine	.08¼	@	.13¼
Box Twine, 2-3 ply	.14¼	@	.14¾
White Hemp	.13¼	@	.16¾
Java Sisal—			
No. 1 Basis	.11½	@	—
No. 2 Basis	.10½	@	—
New Zealand Sisal	.11½	@	—
Sisal Lath Yarn—			
No. 1	.13½	@	.15½
No. 2	.11½	@	.13½
Manila Twine	.24½	@	.29½

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.12	@	.50
Water Marked Sulphite Bond	.06¼	@	.15
Sulphite Bond	.05½	@	.15
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¼
No. 2 S.&S.C. Book	.05¼	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04½	@	.05½
No. 1 Fibre	.04¼	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¾	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.04¾
Sulphite Screenings	.03	@	.03¾
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	41.00	@	—
Sheets, open	46.00	@	51.00
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.70	@	.80
Solid Books	.60	@	.70
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.50	@	.55
Overissue News	.60	@	.70
Old Newspapers—			
No. 1	.50	@	.55
Mixed Papers—			
No. 1	.30	@	.35
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.24
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.10
Manila Sul., No. 1	.03	@	.06
Manila No. 2	.03	@	.05
No. 1 Kraft	.05¼	@	.06½
No. 2 Kraft	.03¾	@	.05
Southern Kraft	2.75	@	4.00
Common Bogus	.03	@	.04½

(Delivered Philadelphia)

News Print Rolls	46.00	@	55.00
Straw Board	40.00	@	45.00
News Board	50.00	@	—
Chip Board	45.00	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.03½	@	.04
New White, No. 2	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.01½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	2.00	@	2.10
No. 1 Soft White	2.05	@	2.10
No. 2 Soft White	1.50	@	1.60
No. 1 Mixed	.95	@	1.00
No. 2 Mixed	.75	@	.80
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.05	@	1.10
No. 1 Books, heavy	.90	@	1.00
No. 2 Books, light	.70	@	.80
No. 1 New Manila	1.20	@	1.50
No. 1 Old Manila	.85	@	.90
Print Manila	.75	@	.80
Container Manila	.65	@	.70
Old Kraft	1.00	@	1.10
Common Paper	.35	@	.40
No. 1 Mixed Paper	.40	@	.45
Straw Board Chip	.40	@	.45
Binders Board Chip	.40	@	.45
Corrugated Board	.60	@	.70
Overissue News	.60	@	.65
Old Newspapers	.40	@	.50

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05¼	@	.11
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05¼	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	.05
No. 2 Kraft	.03½	@	.04½

(F. o. b. Boston)

Southern Kraft	.03½	@	.04½

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)

Common Bogus	.02	@	.02¼

(Delivered New England points)

News Print, rolls	44.50	@	—
Straw Board, rolls	.009	@	35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	45.00	@	50.00
Chip Board	42.50	@	47.00
Chip Board (Creasing)	45.00	@	—
Single Manila Lined Chip	52.50	@	62.50
Single White, Patent Coated News Board—Bender	62.50	@	72.50
Wood Pulp Board	70.00	@	75.00
Binder Boards	62.00	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.40	@	—
No. 1 Soft White	1.75	@	2.00
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.40	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	1.00	@	1.10
No. 1 Books, heavy	.90	@	1.00
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.95	@	1.05
White Blank News	1.20	@	1.30
No. 1 Kraft	1.20	@	—
Manila	.75	@	.80
No. 1 Mixed Papers	.35	@	.40
Print Manila	.45	@	.50
Overissue News	.55	@	.60
Old Newspapers	.50	@	.57½
Box Board Chips	.32½	@	.35
Corrugated Boxes	.45	@	.55
Screening Wrappers	.60	@	.70

Bagging
(F. o. b. Boston)

Manila Rope—			
Foreign	2.50	@	—
Domestic	—	@	2.50
Transmission Rope	1.60	@	—
Mixed Strings	—	@	.60
Jute Rope	1.35	@	—
Jute Carpet Threads	.65	@	.70
Gunny No. 1—			
Foreign	1.50	@	—
Domestic	1.20	@	1.30
Bleachery Burlap	3.00	@	3.25
Scrap Burlap	1.15	@	—
Scrap Sisal	1.25	@	1.35
Scrap Sisal for shredding	1.25	@	1.35
Wool Tares, heavy	1.25	@	1.30
New Burlap Cuttings	1.35	@	1.60
Australian Wool Pouches	2.25	@	2.30
Heavy Baling Bagging	1.40	@	1.50
Paper Mill Bagging	.90	@	1.10
Bagging No. 2	.40	@	.50

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.02	@	.02½
New White No. 1	.06½	@	—
New White No. 2	.04½	@	.05
Silesias No. 1	.04	@	—
New Black Silesias	.02½	@	.03
New Unbleached	.07	@	.07¼
Blue Cheviot	—	@	4.65
Fancy	—	@	.02½
Washable	.02¼	@	—
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black, soft	.04	@	.04¼
Khaki Cuttings	.03	@	.03¼
O. D. Khaki	.03	@	.03¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06¼

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	2.25
White No. 2—			
Repacked	2.00	@	2.25
Miscellaneous	2.00	@	2.75
Twos and Blues	1.25	@	1.50
Thirds and Blues Repacked	1.10	@	1.25
Miscellaneous	.85	@	.90
Black Stockings	2.25	@	2.50
Roofing Stock			
No. 1	1.20	@	1.25
No. 2	.80	@	—
No. 3	.65	@	.70

Foreign Rags
(F. o. b. Boston)

Dark Cottons	1.25	@	1.40
New White Shirt Cuttings	5.50	@	6.00
Dutch Blues	2.00	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.55	@	1.60
Old Linsey Garments	1.40	@	1.50

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¼	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.10¼	@	—
No. 2 Colored	.09	@	.10
Ledgers (sulphite)			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.20	@	—
No. 3 M. F. (Carloads)	5.70	@	—
No. 4 M. F. (carloads)	4.75	@	—
No. 1 S. C. (carloads)	6.65	@	—
No. 3 S. C. (carloads)	6.20	@	—
No. 4 S. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.25	@	—
White Wrap	2.22½	@	—
"B" Manila	4.75	@	—
No. 1 Manila	5.25	@	—
Fiber	5.25	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.25	@	—

(F.O.B. Cars Toronto)

News, per ton—			
Rolls (contract)	45.50	@	—
Sheets	50.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	50.00	@	55.00
Sulphate	50.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.10
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.50
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.50
Printed Manilas	.70	@	—
Kraft	1.25	@	1.50
News and Scrap—			
Strictly Overissue	1.00	@	—
Strictly Folded	.70	@	—
No. 1 Mixed Paper	.60	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.05¼	@	.05¾
Fancy Shirt Cuttings	.02¼	@	.02½

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